

K.5

EPA Region 5 Records Ctr.



200919

**American Chemical Service, Inc.  
USEPA/ARCS V  
Oversight Summary  
Upper Aquifer Investigation**

K5

# Letter of Transmittal

## BLACK & VEATCH Special Projects Corp.

101 North Wacker Drive, Suite 1100, Chicago, Illinois, 60606, Phone (312) 346-3775, Fax (312) 346-4781

To: Ms. Sheri Bianchin  
United States Environmental Protection Agency  
77 West Jackson Boulevard (HSRW-6J)  
Chicago, Illinois 60604

Date: April 8, 1996  
From: Matt Mastronardi  
Project: American Chemical Services  
Project No.: 71670  
File: C.3

We are sending you:  Attached  Under separate cover via \_\_\_\_\_

Preliminary Report

Specifications

Final Report

Change Order

Other: Upper Aquifer Oversight Reports;  
Disk copy of PGCS review comments

Addendum

These items are transmitted:

As requested

For your information

For your approval

For review and comment

Remarks: Oversight summary reports for the Upper Aquifer investigation and a disk copy of the review comments  
for the Perimeter Groundwater Containment System (PGCS) are included. The hard copy of the PGCS  
comments were delivered on April 4.

Copy To: Steve Mrkvicka, BVSPC

Signed: Matt Mastronardi

April 8, 1996

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## USEPA/ARCS V BVSPC Oversight Summary

Reporting Period: March 4, 1996 Hours Worked: 12  
 Site Name/Location: ACS/Griffith, IN BVWS Project No.: 71670.600  
 USEPA Work Assignment Manager: Sheri Bianchin  
 Project Manager: Steve Mrkvicka

Personnel Summary Affiliation	No. of Personnel	Responsibility
Montgomery Watson	1	PRP Contractor
Terra Trace	2	Geoprobe Subcontractor
BVSPC	1	USEPA Oversight Contractor

**Summary of field activities:** On March 4, 1996 Montgomery Watson concluded the upper groundwater investigation at the south edge of the plume. Previously this area had not been defined because site access had not been granted. During field activities on March 4, five more hydropunch samples were collected and analyzed.

**Problems Encountered/Corrective Actions:** No problems were encountered.

Signature: Matt Martin Date: 3-27-96  
for Ramona Reints S:\projects\ACS\wos30496.wp5

44

- 1230 They purged and collected GP151  
Cleighton discarded the first two vials
- 1300 Arrived at GP152 Located  
200 ft SSE of GP151
- 1315 They pushed the slotted  
pipe to 9 ft. However  
there is no way for us to  
know where water is. He  
moved over 2 feet and will  
push some rods to 9 ft and  
check for water
- 1320 Water is at 4 ft They will  
attempt to collect sample at  
the first hole
- 1335 Collected GP152
- 1430 Arrived at GP153 Located  
200 ft SSE of GP145
- 1500 Collected the first vial
- 1515 Collected the second vial.
- 1540 Back at the trailer Cleighton  
purged off the GP153 sample
- 1600 Arrived at P63 leachate seep
- 1615 Cleighton filled two 40-ml vials  
calling the sample SW-101 strong odor  
noticeable shear
- 1640 Left site

Randy

3/1/96

RJF 3/4/96

45

4 MARCH 1996 Monday

0700 REINTS IS ONSITE. MW AND TERRA TRACE ARE PRESENT AND  
SETTING UP

WEATHER: 13° F, MOSTLY CLOUDY. HIGH  
OF 40°F IS EXPECTED

TODAY THE SHALLOW AQUIFER INVESTIGA-  
TION CONTINUES SOUTH OF THE SITE  
STARTING WITH GP154.

0720 REINTS / HAFNER DEPART  
SITE TRAILER FOR GP LO-  
CACTION

0730 AT GP154, TERRA TRACE IS  
SETTING UP.

0755 HAMMERDRIVING AT GP154 STARTS.

0800 GROUNDWATER IS AT 2 FEET,  
WE WILL DRIVE DOWN TO 7 FEET

0807 TEFILON TUBING HAS BEEN IN-  
SERTED INTO THE ROD AND  
PURGING STARTS

0810 2 40 ML VIALS OF SAMPLE ARE  
COLLECTED.

0814 THE HOLE IS FILLED WITH  
BENTONITE CHIPS

0822 MOBING ON GP155 LOCATION.

1827 WATER IS AT 2.5 FEET. WE

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M/S 3/4/96

- WILL DRIVE RODS TO 7.5 FEET
- 0832 PURGING STARTS. THE WATER IS VERY CLOUDY/MUDGY.
- 0835 TWO 40 ML VIALS ARE TAKEN.
- 0843 HEFFENER SHUTTLES THE SAMPLES UP TO THE OFFICE TRAILER. CREW MOBES TO GP 156. THE GEO PROBE LOCATIONS WERE MEASURED AND STAKED BEFORE GP154 WAS DRIVEN
- 0946 DRIVING AT GP 156 STARTS.
- 0849 WATER IS AT ABOUT 2 FEET.
- WE WILL DRIVE TO 7 FEET.
- 0854 PURGING AT GP156 STARTS
- 0858 HEFFENER ARRIVES IN TIME TO CATCH THE NEXT SAMPLE.
- 0902 TWO 40 ML VIALS ARE COLLECTED, THE HOLE IS BEING FILLED WITH BENTONITE CHIPS
- 0910 HEFFENER POURS A FIELD BANK. WATER IS POURED THROUGH A ROTO SCREEN.
- 0920 MOBING AT GP-157, THIS IS A LOW AREA WITH ICE ON THE

M/S 3/4/96 47

- GROUNDED SURFACE.
- 0921 DRIVING STARTS AT GP-157.
- 0922 WATER IS AT 1 FOOT BELOW THE SURFACE (LESS THAN THAT IS PROBABLY PE.) ANOTHER 5 FEET WILL BE DRIVEN.
- 0927 THE HOLE PURGES DRY ALMOST IMMEDIATELY
- 0935 STILL WAITING FOR THE HOLE TO RECHARGE.
- 0938 HEFFENER ATTEMPTS TO FILL A 40ML VIAL, BUT IS UNSUCCESSFUL AND THROWS IT OUT
- 0945 HEFFENER FILLS A VIAL
- 0955 HEFFENER ATTEMPTS TO FILL ANOTHER 40ML VIAL, BUT IS UNSUCCESSFUL
- 1007 HEFFENER/REINTS DELIVER SAMPLES TO OFFICE TRAILER WHILE WAITING FOR THE HOLE TO RECHARGE.
- SAMPLES HAVE NOT BEEN RUN YET.
- 1018 HEFFENER FILLS THE LAST VIAL.
- 1020 THE HOLE IS PLUGGED WITH BENTONITE CHIPS
- 1030 LEAVING GEO PROBE AREA OF ACTIVITY. WT WILL DELIVER THE LAST SAMPLE

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M/S 3/4/96

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AND WAIT FOR RESULTS.

1130 IT TRAILER WAITING FOR RESULTS,  
WE WILL PROBABLY BE WAITING  
UNTIL 1400

1300 MW STATES THE WATER SAMPLE  
FROM GP-154 IS CLEAN.

1335 MW STATES THE WATER  
SAMPLE FROM GP-155 IS CLEAN.

1357 MW STATES THE WATER SAMPLE  
FROM GP-156 HAS BENZENE  
AND ACETONE (SO FAR) A  
RELATIVELY NICE PEAK, NSO  
PPB

1410 MOVING BACK THE GEOPROBE  
ACTIVITY AREA. TWO MORE  
PROBES WILL BE DRIVEN —

OUTSIDE OF GP-156

<sup>2m</sup>  
1417 HEPFNER HAS MEASURED THE  
GP-158 LOCATION (RELATIVE TO  
OTHER GP LOCATIONS). DRIVING

<sup>3m</sup>  
STARTS.

1439 WATER IS AT 3 FEET, WE WILL  
DRIVE TO 8 FEET.

1435 WATER IS BEING PURGED FROM  
GP-158

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1437 TWO 40 ML VIALS ARE COLLECTED.

1446 AT GP-159 LOCATION, DRIVING  
STARTS

1448 WATER IS AT 2 FEET, SO WE  
WILL DRIVE ANOTHER 5 FEET

1456 PURGING AT GP-159 STARTS.

1458 SAMPLING AT GP-159 STARTS.

HEPFNER FILLS TWO 40ML VIALS —  
1510 BACK AT OFFICE TRAILER, MW IS  
RUNNING A BLANK. GP-159 WILL  
BE RUN NEXT

1600 SO FAR GP-159 HAS NO ACETONE  
AND NO BENZENE APPARENT.

TWO MORE PROBE LOCATIONS  
WILL BE DONE AROUND GP-157  
BECAUSE OF BENZENE/ACETONE  
FOUND THERE.

1612 AT GP-160 LOCATION, DRIVING ROD  
STARTS.

1613 WATER IS AT 1 FOOT, SO WE WILL  
DRIVE TO 6 FEET

1617 PURGING STARTS, THE HOLE IS PURGED DRY

1621 THE FIRST 40 ML VIAL IS COLLECTED.

1624 THE SECOND VIAL IS COLLECTED.  
GP-160 IS SOUTH OF GP-157.

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RJF

3-4-96

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1627 GP-160 HAS BEEN FILLED WITH  
BENTONITE CHIPS.

1632 MOVED ONTO THE GP-161 LOCATION.  
DRIVING STARTS. GP-161 IS  
NORTHWEST OF GP-157 —

1633 WATER IS A HALF A FOOT  
BELOW GROUND - ICE IS AT THE  
GROUND SURFACE HERE AND AT  
GP-160. WE WILL DRIVE TO 5.5  
FEET.

1638 PURGING STARTS - A VERY SMALL  
VOLUME OF WATER IS OBTAINED.

1640 HEFFNER BEGINS FILLING THE  
FIRST VIAL WITH WATER —

1644 THE FIRST VIAL HAS BEEN FILLED.  
WAITING FOR RECHARGE.

1646 FILLING THE SECOND VIAL.

1648 SECOND VIAL IS FULL. TERRA  
TRACE PLUGS THE HOLE.

1705 BACK AT SITE TRAILER, MW SAYS  
THE WATER SAMPLES FROM GP  
158 AND GP159 ARE CLEAR.

1708 REINIS EXITS SITE.

RJF 3-4-96

## USEPA/ARCS V BVSPC Oversight Summary

Reporting Period: March 5, through 8, 1996 Hours Worked: 42

Site Name/Location: ACS/Griffith, IN BVWS Project No.: 71670.600

USEPA Work Assignment Manager: Sheri Bianchin

Project Manager: Steve Mrkvicka

Personnel Summary Affiliation	No. of Personnel	Responsibility
Montgomery Watson	2	PRP Contractor
BVSPC	1	USEPA Oversight Contractor

**Summary of field activities:** On March 5, 1996 Montgomery Watson began well development at the ACS site. Development occurred in accordance with the revised Specific Operating Procedures. Generally, development occurred by surging wells with a bailer for 20 minutes and then removing three well and sand pack volumes of water from the well while surging with the Grundfos pump. Next, field parameters were recorded until stabilization within 10 percent was achieved. Montgomery Watson completed well development on March 8, 1996.

**Problems Encountered/Corrective Actions:** The only problems encountered were muddy conditions and temperamental equipment.

Signature: Matt Mankin Date: 3-27-96  
for Ramona Reints S:\projects\ACS\wos30596.wp5

94

TUES , 3/5/96

RJF 3/5/96

0740 REINTS ARRIVES ON SITE.  
 MW IS PACKING UP THE GC. (RAMSBY  
 AND PAULI ARE MW REPS) PAULI  
 WILL DEPART SOON. RAMSBY WILL BE  
 DEVELOPMENT DEVELOPING WELLS IN FROM LOWER AQUIFER THIS WEEK.

0755 REINTS TRIES TO CALL HOLLY  
 GREJDJA AT ANOTHER SITE, BUT SHE IS ON HER WAY TO HER HOTEL.  
 SURVEY CREW ARRIVES TO SURVEY IN GBP LOCATIONS FROM YESTERDAY.

0815 REINTS CALLS GREJDJA AT HER HOTEL, BUT SHE IS NOT THERE. REINTS LEAVES A MESSAGE THAT SHE IS CALLING TO CONFIRM DEVELOPMENT APPROVAL.

WEATHER: 32°; WINDS TO 10 MPH <sup>ON OFF</sup> OVERCAST. WINTER STORM WATCH IN EFFECT. LOTS OF RAIN LAST NIGHT MAKES IT VERY MUDDY TODAY

0840 REINTS LEAVES A MESSAGE FOR MARK VICKA RE: CALLS

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3/5/96

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TO GREJDJA.

0850 GREJDJA CALLS AND CONFIRMS APPROVAL OF DEVELOPMENT. RAMSBY IS CALIBRATING PTT METER.

0930 RAMSBY RECONS BAILOR

0945 REINTS/RAMSBY PROCEEDED TO LOCATION WHERE MW3G AND PZ4H ARE.

0955 RAMSBY IS PUTTING SAND BETWEEN THE RISER & PROTECTIVE CASING.

1002 WATER LEVEL - 15.60 IN MW3G. TOTAL DEPTH - 95.15

THE WELL HAS A 12 FOOT SAND PACK. RAMSBY CALCULATES 18.1 GALLONS FOR 1 VOLUME OF WELL + PACK.

1012 SURGING STARTS AT MW3G.

1030 SURGING STOPS. PUMP (GROUNDFAS) IS BEING COMMISSIONED.

1115 RAMSBY IS ALL SET UP TO PURGE WITH THE PUMP, BUT NOW IT WON'T OPERATE. NO ELECTRICITY SEEMS TO REACH IT

1135 MW SUPER PHIL SMITH HAS ARRIVED

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SMITH IS TAKING WATER LEVELS AT WELLS IN THE AREA. GROUNDFOOT IS STILL NOT WORKING.

1145 SMITH EXITS - REINTS INCORRECTLY STATED HE WAS TAKING WATER LEVELS WHEN HE WAS REMOVING DATA LOGGERS.

1202 PURGING STARTS. THE PUMP IS WORKING AND APPEARS TO BE FICKLE ABOUT THE ELECTRICAL CONNECTION.

1218 ABOUT 40 GALLONS PURGED AT 3 GAL/ MINUTE

1245 PURGING DONE. ABOUT 110 GALLONS REMOVED. PH 7.93, TURBIDITY - 3.5, COND. - 410 TEMP 11°C

1254 WATER LEVEL & TOTAL DEPTH OF PZ 44 ARE MEASURED. LEVEL - 14.24 TD - 75.10.

1300 PURGING AT PZ 44 STARTS. SURGING IS OCCURRING SIMULTANEOUSLY

1306 ABOUT 50 GALLONS REMOVED.

WATER LEVEL IN MW36 + PZ44

+315 + TOTAL DEPTH RE-MEASURED.

Ramona RJ 3/5/96

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MEASUREMENTS ARE THE SAME

1322 BACK AT SITE TRAILER. THE PURGE WATER IS ALL IN A 200 GALLON TANK ON THE BACK OF A PICK UP. THE TANK WILL NOW BE EMPTIED INTO 55 GALLON DRUMS

1345 REINTS/RAMSBY EXIT SITE TO PICK UP LUNCH AND A SOCKET TO OPEN FLUSH MOUNTS

1430 REINTS CALLS BANCHIN AND LEAVES HER A MESSAGE TO UPDATE HER ON SITE ACTIVITIES

1440 RAMSBY IS ON THE PHONE TO HIS OFFICE.

1456 AT THE MW28 LOCATION, MW28 WILL BE DEVELOPED, PZ 42 & 43 WILL BE PURGED

WATER LEVEL IS 25.97' AND

1502 TOTAL DEPTH OF 751' ARE MEASURED AT MW28

1517 DECONNIVING THE PUMP - AGAIN WE HAD A HARD TIME GETTING IT TO RUN.

1524 SURGING STARTS

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98

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VOLUME WAS CALCULATED AT 12.4  
GALLONS.

1545 PURGING STARTS. 3.7 GALLONS  
WILL BE REMOVED, THEN  
FIELD PARAMETERS WILL START.  
1607 FINAL READING OF NINE TAKEN.  
AT N 73 GALLONS, PH = 8.06,  
CONDUCT: 240, TEMP = 11, TURBID =  
5.2

1617 FINAL WELL DEPTH / WATER LEVELS  
Z6-FOOTER 70.1 FEET, 26 FEET  
FOR MW 28  
PZ-42 MEASUREMENTS TAKEN.

1625 WATER LEVEL 25.65 FEET,  
DEPTH 84.9 FEET.

1630 PURGING STARTS AT. PZ-42  
SIMULTANEOUS SURGING IS DONE.

1635 PUMPING IS COMPLETE - W/IN  
PUMPED UNTIL CLEAR.

1645 WATER LEVEL OF 1243: 25.89,  
TOTAL DEPTH : 99.15

1656 PURGING/SURGING COMPLETE

1706 CLEANUP AT THIS AREA IS COMPLETE  
1720 REINTS EXITS SITE

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99

WED, 3/6/96 RJF

0730 REINTS ARRIVES AT ACS. THE  
GATE TO THE SITE TRAILER AREA IS  
LOCKED, SO REINTS WAITS OUTSIDE  
FOR RAMSBY  
WEATHER 25°, OVERCAST, WINDS  
VARYING 5-15 MPH OUT OF THE  
NORTH. FROM 1-2" OF SNOW IS  
IN THE FORECAST FOR THE  
AFTERNOON

0750 RAMSBY ARRIVES AND UNLOCKS GATE.  
0800 SURVEY CREW ARRIVES TO FINISH  
SURVEYING IN SOME WELLS  
0845 RAMSBY IS DONE LOADING UP  
SUPPLIES / ETC. RAMSBY EXITS  
SITE TO GAS UP THE GENERATOR  
APPARENTLY OUR GAS CAN HAS  
DISAPPEARED.

0920 ARRIVED AT M4 LOCATIONS TO  
TARGET IN DEVELOP. A LIGHT DRIZZLE  
IS FALLING.

1925 DRIZZLE HAS CHANGED TO SNOW  
0937 DEPTH TO WATER IS 12.23'  
IN MW 35. TOTAL DEPTH 92.7'

0940 RAMSBY DECOMS BAYLOR.  
0143 SURGING AT MW 35 STARTS

RJF 3/6/96

100

WED, 3-6-96 11A

1003 SURGING IS COMPLETE  
NOW RAMSBY WILL DECON  
THE PUMP.

1020 THE PUMP IS BEING DECONNED  
BY RUNNING DETERGENT WATER  
AND THEN CLEAN WATER THROUGH  
IT. THE GOING IS SLOW BECAUSE  
THE DISCHARGE HOSE CONTAINS  
FROZEN WATER AND WAS PLUGGED  
EVEN THOUGH IT WAS KEPT IN  
THE TRAILER LAST NIGHT.

1032 THE PUMP HAS BEEN DECONNED  
& LOWERED IN THE WELL. ONE  
VOLVMG IS CALCULATED AT 18.3  
GALLONS. SNOW IS FALLING  
FURIOUSLY NOW.

1050 PURGING HAS TAKEN PLACE  
FOR ABOUT 15 MINUTES. FLOW  
RATE WAS MEASURED AT APPROX.  
3 GAL/MIN. FIELD PARAMETERS  
START

1103 SIX READINGS WERE TAKEN.  
FINAL READINGS AT ABOUT  
78 GALLONS PURGED: TURBID-  
ITY: 1.1, PH: 8.64, CONDUCTIVITY 335,

NYJ 3-6-96

101

WED, 3/6/96 NYJ

TEMP. 41°

1121 92.9 IS FINAL DEPTH MEASURE-  
MENT IN MW3S

1137 BACK AT OFFICE TRAILER RAMSBY  
IS CALLING HIS OFFICE.

1200 AT LUNCH

1245 BACK FROM LUNCH - WE WILL  
PROCEED TO THE NEXT WELL  
SNOW CONTINUOUS

1250 WE WILL GO TO FLUSH MOUNT  
WELLS FIRST AND INSTALL  
EXPANDING CAP VS. THE SLIP  
CAP THAT IS THERE NOW  
(BECAUSE IT IS BELOW GRADE)  
AND INSTALL LOCKS ON

WELLS THAT NEED THEM  
1310 RAMSBY PUMPS PURGE WATER FROM  
MW3S INTO DRUMS. DRUMS  
ARE STAGED NEAR THE OFFICE  
TRAILER

1320 AT MW29 LOCATION, RAMSBY  
INSTALLS EXPANDING CAP & LOCK

1324 AT MW35, INSTALLING A CAP & NEW  
LOCK.

1333 ARRIVE AHS TO SIGN IN

Parmer 88 3-6-96

WED, 3/6/96

mgf

1339 ARRIVE AT ACS BACK GATE. IT  
IS LOCKED, WE ARE WAITING FOR  
ACS TO COME UNLOCK IT.

1345 ARRIVE AT MW9 AREA. HERE  
WE WILL DEVELOP MW34.

1350 WATER LEVEL IN MW34 IS  
16.00'

TOTAL DEPTH IS 95.3'.

1356 SURGING STARTS.

1357 SURGING IS COMPLETE. PUMP  
IS BEING DECONNED.

1358 PUMP IS NOT WORKING - IT MAY  
BE FROZEN UP BECAUSE IT STRAIN  
TO 1440. RAMSBY HAS TAKEN PUMP

TO TRAILER TO SEE IF IT WILL  
OPERATE WITH SURGE-FREE  
ELECTRICITY.

1500 BACK AT MW34 - PUMP IS  
THAWED OUT, DECONNED, IN  
THE WELL.

1506 PURGING STARTS. RAMSBY  
CALCULATES 18 GALLONS/VOLUME.  
1516 PURGING CONTINUES - READINGS  
OF FIELD PARAMETERS START.

mgf 3/6/96

WED

3/6/96

mgf

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1529 LAST OF SEVEN READINGS  
ARE TAKEN. VOLUME APPROX 91  
GALLONS, TURBIDITY 1.2, PH 8.46,  
CONDUCTIVITY 470, TEMP 10

1541 WATER LEVEL + DEPTH ARE  
RECHECKED + ARE THE SAME  
AS AT 1350.

WE WILL THAW OUT PUMP  
AFTER SURGING MW29.

1545 MW29 HAS WATER LEVEL AT  
15.97, DEPTH IS 62.15.

1547 SURGING STARTS AT MW29.

1602 SURGING ENDS.

1612 BACK AT TRAILER TO PUMP  
PURGE WATER + THAW PUMP.

1620 REINTS CHECKS WITH MR KUICKA  
AT THE BV OFFICE.

1635 PUMP IS DECONNED AND THAWED.  
PURGE WATER WAS PUMPED INTO  
DRUMS. RAMSBY MAKES  
A PHONE CALL.

1700 PROCEEDED TO MW29 TO PURGE.

1715 PURGING STARTS. 12.8 GAL/VOLUME.

1727 ABOUT 3 VOLUMES PURGED NOW.

1732 FINAL READING OF 8' IS TAKEN.

NOT 3/6/96

104

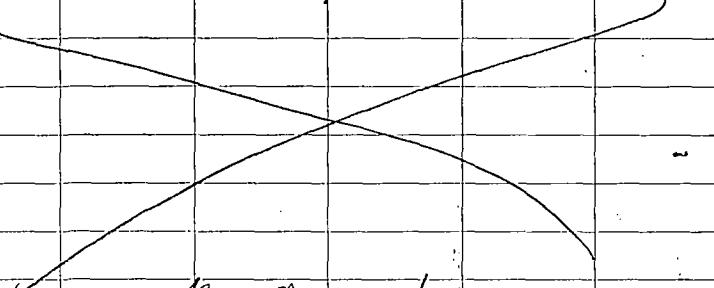
WED

3/6/96

Mjt

1738PH = 8.55, TURBID = 12, --  
CONDUCTIVITY = 465, TEMP = 10.-1750RAMSBY TAKES ANOTHER  
TOTAL DEPTH READING  
AND REINTS/RAMSBY EXIT  
MW9 AREA1800BACK AT SITE TRAILER,  
RAMSBY UNLOADS PUMP+INSTRUMENTS,  
SETS UP TO PUMP PURGE  
WATER INTO DRUMS.1810REINTS CALLS BIANCHINI'S  
VOICEMAIL WITH A REPORT OF  
TODAY'S ACCOMPLISHMENTS1815REINTS LEAVES A VOICEMAIL  
MESSAGE FOR BERENA AT  
BLACK + VEATCH RE: SAMPLE  
CONTAINERS AND SAMPLE PICK-  
UP FOR NEXT WEEK.1830

REINTS/RAMSBY EXIT SITE



Mjt 3/6/96

105

THURS 3/7/96

Mjt

1730 REINTS ARRIVES ONSITE. THE  
GATE IS STILL LOCKED1735 RAMSBY ARRIVES AND UNLOCKS  
THE GATEWEATHER: SEVERAL INCHES OF SNOW  
HAVE FALLEN OVERNIGHT - SEVERAL  
INCHES OF LAKE EFFECT SNOW  
HAD BEEN FORECAST. TEMP IS  
ABOUT 10°, WINDS ARE OUT OF  
THE NORTH 0-5 MPH0750 DEVELOPING TECHNIQUES ARE  
DISCUSSED. THE PUMP WAS USED  
TO SURGE DURING PURGING, IT  
APPEARS TO WORK BETTER AND  
FASTER THAN THE BAUDOR. TODAY  
THE AMOUNT OF TIME SPENT SURGING  
WITH THE BAUDOR MAY BE SHORTENED  
AND MORE SURGING WITH THE PUMP  
WILL BE DONE TO COMPENSATE1800 REINTS/RAMSBY PROCEED TO MW9  
LOCATION. WE WILL SURGE WELLS  
FIRST AND COME BACK TO THE TRAILER  
FOR THE PUMP RIGHT BEFORE WE  
NEED IT TO KEEP IT FROM FREEZING  
UP LIKE IT DID YESTERDAY

3/7/96 Mjt

106

THURS 13/7/96

R J S

- 0818 ARRIVE AT MW 30. WATER LEVEL IS 9.72. TOTAL DEPTH 59.2.
- 0820 SURGING STARTS.
- 0833 SURGING IS COMPLETE — WATER LEVEL AT MW 33: 12.56' TOTAL DEPTH: 88.1' SNOW IS FALLING & AGGRAVATED.
- 0835 SURGING STARTS AT MW 33.
- 0848 SURGING STOPS —
- 0858 ARRIVE AT MW 31 AND MW 32.
- 0859 WATER LEVEL OF MW 32 IS 20.07' TOTAL DEPTH: 104.5'
- 0902 WATER LEVEL OF MW 31: 19.84' TOTAL DEPTH: 76.9'
- 0904 SURGING AT MW 31 STARTS.
- 0914 SURGING STOPS —
- 0917 SURGING AT MW 32 STARTS —
- 0927 SURGING STOPS —
- 0937 BACK AT SITE TRAINER TO PICK UP PUMP + INSTRUMENTS.
- 0940 REINTS CALLS BV OFFICE RE: CAMPING NEXT WEEK —
- 1000 PROCEEDING TO ACS
- 1012 SIGNING IN AT ACS —
- 1005 BACK GATE IS LOCKED, PROCEEDED

3/7/96 RJS

107

THURS. 3/7/96 RJS

TO ACS OFFICE TO ASK FOR SOMEONE TO OPEN THE GATE.

WELL VOLUMES ARE CALCULATED —

MW 30 - 13.3 GALLONS —

MW 33 - 17.5 GALLONS —

MW 32 - 18.9 GALLONS —

MW 31 - 14.5 GALLONS —

- 1028 BACK AT ACS OFFICE TO ASK SOMEONE TO OPEN THE GATE

- 1031 BACK AT TRAILER TO THAW PUMP OUT. BOART LONGYEAR HAS ARRIVED TO PICK UP SUPPLIES. IT HAS BEEN SNOWING REALLY HARD FOR ABOUT HALF AN HOUR.

- 1042 ARRIVE AT MW 8 LOCKDOWN — PUMPING AT MW 33 STARTS — ABOUT 50 GALLONS WILL BE PUMPED BEFORE READING'S START

- 1053 SURGE/PURGE AT MW 33 STARTS

- 1124 LAST OF 8 READINGS IS TAKEN. VOLUME: 8.6 GALLONS, TURBID 9.8, P/H - 7.77, TEMP 10°

- 1130 FINAL READING AT MW 33 IS 88.1' DEPTH (TO BOTTOM)

- 1135 BACK AT TRAILER TO DECON PUMP —

3/7/96 RJS

WMM THURS 3/7/96 - Pg 6  
11418 PUMP IS DECONNED - WE'RE  
BACK AT MW30 —  
1153 SURGE / PURGE STARTS —  
1218 LAST OF 10 READINGS ARE  
TAKEN - PH = 8.37, COND = 680,  
TEMP = 10.5°, TURBID = 11v6 —  
1226 NEXTHUN TOTAL DEPTH = 5921.  
1235 BACK AT TRAILER TO DECON PUMP.  
DRUM PURGE WATER, EAT —  
1320 PROCEEDING TO NEXT WELL —  
1325 THE TRUCK IS STUCK JUST —  
BEYOND THE ACS BACK GATE.  
WE WILL TRY TO PUSH IT OUT. —  
1425. THE TRUCK IS STILL STUCK.  
RAMSBY TRIED PUSHING IT OUT  
WITH THE BOBCAT AND NOW —  
THE BOBCAT IS STUCK TOO —  
1525 - STILL STUCK —  
1540 BOTH BOBCAT & TRUCK ARE  
FREE - WE WILL ACCESS  
MW8 FROM THE RAILROAD  
TRACKS THAT RUN JUST NORTH  
OF MW8. —  
1550 PUMP IS FROZEN UP AT MW8. WE  
WILL THAW IT OUT AT THE TRAILER

18 if 3/7/96

109  
THURS 3/7/96 Rj  
1555 SIGNING OUT AT ACS —  
1610 THAWING OUT THE PUMP IN THE  
TRAILER. —  
1620 REINTS CALLS MRKVICKA AND  
UPDATES HIM ON TODAYS ACTIVITIES.  
1645 THE PUMP IS STILL NOT THAWED.  
WE'LL TRY AGAIN TOMORROW.  
REINTS OPPOSITE

RJ 3/7/96

110

FRIDAY, 3/18/96 *YJ*

0722 REINTS ARRIVES ON SITE. TODAY  
WE WILL FINISH DEVELOPING  
MW 31 AND MW 32 —

WEATHER: CLEAR, 4° WINDS GALE MN  
ABOUT 5 MPH. WINDCHILL IS -29.

HIGHS IN THE TEENS EXPECTED

0740 PROCEEDING TO THE WELLS —

0755 PUMPING AT MW 31 STARTS  
SURGING WITH PUMP OCCURRING

SIMULTANEOUSLY —

0810 3 VOLUMES - ABOUT 45 GALLONS  
ARE PURGED. READINGS START

0816 FINAL OF 6 READINGS IS  
TAKEN - COND 475, TURBID

10.2, pH = 8.54, TEMP = 10.

0830 PUMPING AT MW 32 STARTS  
WITH SURGING. —

0852 ABOUT 57 GALLONS ARE  
PURGED. READINGS START

0857 LAST OF 6 READINGS -  
COND = 430, pH = 9.03, TEMP =

10, TURBD = 44.

0900 FINAL DEPTHS —

MW 31 - 77.05 —

MW 32 - 104.5 —

*YJ* 50 3/18/96

111

FRIDAY 3/18/96 *RJ*

0930 BACK AT SITE TRAILER TO  
DOFF Y. TRANSCRIBE LOGBOOK  
ENTRIES

000 OFFSITE —

*RJ* 50 3/18/96

## USEPA/ARCS V BVSPC Oversight Summary

Reporting Period: March 12, through 14, 1996 Hours Worked: 34

Site Name/Location: ACS/Griffith, IN BVWS Project No.: 71670.600

USEPA Work Assignment Manager: Sheri Bianchin

Project Manager: Steve Mrkvicka

Personnel Summary Affiliation	No. of Personnel	Responsibility
Montgomery Watson	2	PRP Contractor
BVSPC	1	USEPA Oversight Contractor

**Summary of field activities:** On March 12, 1996 Montgomery Watson began sampling the wells installed during the Lower Aquifer Investigation at the ACS site. Sampling occurred in accordance with the revised Specific Operating Procedures. Montgomery Watson purged the wells using a low flow pumping rate, about 300 ml per minute. After a gallon of water was removed from each well, field parameters were recorded. When field parameters stabilized within 10 percent, sampling off of the pump began. BVSPC collected split samples at MW29, MW30, MW32, and MW35.

**Problems Encountered/Corrective Actions:** The only problems encountered were muddy conditions and temperamental equipment.

Signature: Matt Marshi Date: 3-27-96  
for Ramona Reints S:\projects\ACS\wos31296.wp5

112 MON, 3/11/96 *Mammal*  
0745 REINTS / BERENA OPEN SEALED  
CASES OF 40 ML PRESERVED VOLVS, 80 oz.  
AMBERS, AND 1L. POLY BOTTLES.  
BERENA / REINTS ATTACH LABELS,  
REINTS ADDS PRESERVATIVES TO  
METALS & CYANIDE BOTTLES

113 TUES, MARCH 12, 1996  
0850 REINT ARRIVES ON SITE.  
SITE TRAILER AND GATE ARE UN-  
LOCKED, BUT NO ONE IS AROUND.  
WEATHER SUNNY, MID FORTIES,  
HIGHS IN THE FIFTIES AND  
LIKELY. WINDS OUT OF THE  
SOUTH 5-10 MPH  
0905 RAMSBY ARRIVES. REINTS WILL  
COMPLETE SAMPLE PAPERWORK  
WHILE SAMPLING PREPARATIONS  
OCUR. TODAY WE WILL BE  
SAMPLING THE NEW WELLS.  
SAMPLING WILL PROBABLY TAKE  
3 TO 4 DAYS

1005 WORK CONTINUING.  
1022 MONTGOMERY WATSON ARR.  
TOM DUSHEK ARRIVES.  
RAMSBY IS DECONNING THE  
PUMP. DUSHEK IS LABELING  
BOTTLES AND FILLING OUT  
TAGS.

1110 RAMSBY COLLECTS PUMP BLANK.  
1135 REINTS IS CALLING LANTZ TO  
DISCUSS WHETHER THE PUMP  
BLANK SHOULD BE COLLECTED

488 2/11/96

MBJ 3/12/96

114

RJS

WELL SAMPLE #S	VOA	BNA	WELL
962B05R01 ACS-GW01-001	X	X	MW29
TAG #S 962B04S02 ACS-GW02-001	5-180456-61	5-180462-65	—
X	X	MW35	
TAG #S 962B05D02 ACS-GW02-101	5-180470-71	5-180472-73	—
X	X	MW35	
TAG #S 962B05S03 ACS-GW03-001	5-180476-7	5-180478,480	—
X	X	—	
TAG #S 962B05S04 ACS-GW04-101	5-180482-83	5-180484-85	MW30
X	X	MW32	
TAG #S 962B05R01 ACS-RG01-201	5-180151-52	5-180153-54	—
X	X	RINSATE	
TAG #S 962B05R02 ACS-TB01-201	5-181919-20	5-181921-2	—
X	—	TRIP	
TAG #S 962B05R03 ACS-TB02-201	5-180488-89	—	—
X	—	—	
TAG #S	5-180490-91	NOT	—

RJS

115

WELL	METALS	CYANIDE	DATE / TIME
—	X	Y	3-13-96 / 1035*
5-180466-7	5-180468-9	X	3-13-96 / 1420
—	X	X	3-13-96 / 1420
5-180474	5-180475	X	3-13-96 / 1420
—	5-180479	5-180481	3-13-96 / 1440
—	X	X	3-14-96 / 1120
5-180486	5-180487	X	3-14-96 / 1120
—	X	X	3-12-96 / 1140
5-180155	5-180156	X	3-12-96 / 1140
—	X	X	3-12-96 / 1140
5-181923	5-181924	—	3-12-96 / 1435
—	—	—	—

COLLECTED —

\* = MS/MSD

RJS

RJS

116 TUES, 3-12-74

USING HPLC WATER REINTS HAS  
OR DI WATER MW IS USING. THE  
ISSUE IS DISCUSSED AND IT IS DE-  
CIDED TO USE MW'S WATER.

1140 TB01 IS COLLECTED AND PUT  
IN A COOLER WITH ICE. SAMPLES WILL  
BE STORED ON ICE LOCKED IN THE  
SUBURBAN.

1200 ALL OFF SITE TO PICK UP LUNCH,  
SUPPLIES.

1250 BACK ONSITE. REINTS HAS  
CHECKED HER VOICEMAIL AND THERE IS  
A MESSAGE FROM BLANCHIN.

1305 PROCEEDING TO MW3G.

CONDITIONS ARE VERY MUDDY.

1325 RAMSBY IS LOWERING THE GRUNDFOS  
PUMP DOWN MW3G. IT WILL BE  
POSITIONED 1 FOOT ABOVE THE SCREEN.

RAMSBY IS PUTTING THE NEW PVC ETHERYLENE  
TUBE ON THE PUMP LINE AS HE LOWERS IT.

1330 REINTS RETURNS BLANCHIN'S  
CALL, BUT RECEIVES HER VOICE  
MAIL. REINTS LEAVES BLANCHIN  
A MESSAGE.

1344 PURGING MW3G STARTS.

3/12/96 JPM

TUES 3/12/96 JPM

117

RAMSBY IS TIMING THE FLOW  
RATE WITH A SMALL VESSEL AND  
HIS WATCH. HE STATES THE  
WATER LEVEL IS 15.68' AND  
THE FLOW RATE IS CLOSE TO 300  
ML/MINUTE.

1352 RAMSBY / DUSHK BEGIN TAKING  
FIELD PARAMETERS.

1405 RAMSBY STATES THE FIELD PARA-  
METERS ARE STABLE, BUT THEY  
WILL CONTINUE PURGING A FEW  
MORE MINUTES.

1410 TURBIDITY HAS DROPPED FROM  
28.7 TO 17.9. PURGING CONTINUES.

1420 BLANCHIN CALLS FOR AN UPDATE.  
REINTS CHECKS HER VOICEMAIL FOR  
DIRECTIONS TO SPLIT SAMPLES, BUT  
THERE IS NO MESSAGE ON THE  
MATTER YET.

TURBIDITY READING MOST RECENTLY  
TAKEN IS 15.6.

1435 REINTS POURS TB01/R02  
THE TRIP BLANK IS POURED USING  
HPLC WATER AND ICED IMMEDIATELY.

3/12/96 JPM

TUES., 3-12-96 RJS  
THE HPLC WATER WAS TAKEN  
FROM A CM STOODY-SEALED BOX.  
RAMSBY IS STILL PURGING AT  
MW3G BECAUSE TURBIDITY IS  
DROPPING.

1455 FIELD PARAMETERS ARE STABLE  
TURBD COND TIME = 3.0, pH = 7.22  
TEMP = 13.5, COND = 550

1500 SAMPLING AT MW3G IS  
OCURRING.

1515 SAMPLING IS DONE, REINTS  
DOES NOT SPLIT

1535 REINTS CALLS LANTZ TO SEE  
IF SPLIT LOCATIONS ARE  
CHOSEN, HE SAYS NO. REINTS  
INDICATES MW MAY SAMPLE AT  
MW7 NEXT, A DECISION IS  
NEEDED. LANTZ WILL CALL  
BIANCHIN

1540 REINTS CALLS LANTZ AND  
SAYS MW WON'T SAMPLE AT  
MW7 LOCATION BECAUSE THERE  
IS NOT ENOUGH DAYLIGHT TO  
SAMPLE BOTH WELLS TONIGHT  
SO THEY WILL GO TO MW28.

RJS 3/12/96

TUES., 3-12-96 RJS 119  
LANTZ IS ON THE PHONE  
AND CAN'T TAKE MY CALL.  
RAMSBY/PUSHK DECON THE  
PUMP.

1555 MOVING TO MW28

1610 PURGING AT MW28 HAS  
STARTED.

1625 FIELD PARAMETERS ARE  
BEING TAKEN.

1725 FIELD PARAMETERS ARE STABLE  
WITH THE EXCEPTION OF TURBIDITY.

1810 FIELD PARAMETERS STABILIZE.

TURBID = 1.4 pH = 7.30

COND = 500 TEMP = 13.6

1812 RAMSBY BEGINS FILLING UOA  
TARS

1818 SAMPLE COLLECTION IS COMPLETE.  
PUSHK IS FILTERING METALS  
FRACTION

1830 MEINTS OFF SITE

RJS 3/12/96

121 WED 3/13/96 *PJF*

0730 REINTS ARRIVES ON SITE. A  
LARGE DUMPSTER IS BEING DELIVERED BY WASTE MANAGEMENT.

WEATHER: ABOUT 40°, CLOUDY. HIGH OF 55°-60° EXPECTED.

REINTS RECEIVED INSTRUCTIONS ON WHICH WELLS TO SAMPLE FROM LANTZ:  
MW29, MW32, MW35, MW30, MW10.  
(OPTIONAL LOCATION)

REINTS CALLS LANTZ AND LEAVES A MESSAGE THAT WE ARE NOT SAMPLING MW10.

RAMSBY IS DECONNNG THE PUMP AND PUSHK IS LOADING EQUIPMENT INTO THE VAN.

0825 SIGNING IN AT ACS. REINTS HAS TALKED TO LANTZ. HE HAS CALLED <sup>ED</sup> BIANCHIN RE: SAMPLING AT MW10.

0831 BACK AT MW9, RAMSBY AND PUSHK ARE LOWERING THE PUMP DOWN MW34, INSTALLING NEW POLYETHYLENE TUBE AS THEY GO.

0833 PURGING AT MW34 HAS STARTED.

*PJF* 3/13/96

121 ED, 3/13/96 *CWJ*

0850 RAMSBY IS LOWERING A SECOND PUMP + NEW POLYETHYLENE TUBE DOWN MW29.

0903 PUMPING AT MW29 HAS STARTED. REINTS WILL COLLECT HER MS/MSD AT MW29, MW WILL GET THEIRS AT MW34.

0905 RAMSBY IS CHECKING FLOW RATES MW IS COLLECTING VOCs, SVOCs, DISSOLVED + TOTAL METALS.

0954 MW34 FIELD PARAMETERS STABILIZE.  
COND: 5.70 - pH: 7.22

TURB: 7.1 - TEMP: 12.7

0957 RAMSBY STARTS FILLING SAMPLE JARS. NOTE: AT ABOUT 0910 REINTS CALLED LANTZ AND INDICATED IT MAY NOT BE NECESSARY TO COLLECT CYANIDE. LANTZ WILL ASK BIANCHIN ABOUT THAT.

1020 RAMSBY IS DONE FILLING SAMPLE JARS AT MW34.

1035 MW29 FIELD PARAMETERS HAVE STABILIZED - SAMPLING STARTS.

1110 REINTS FINISHES FILLING BOTTLES. MW CLEANS UP THE AREA, DRILLS WEEP HOLES

3/13/96 *PJF*

- 122 WED, 3/13/96 7/0
- 1137 BACK AT SITE TRAILER, RAMSBY  
DEANS PUMP, PUSHKEK PREPARES  
FOR NEXT SAMPLE LOCATION.  
REINTS 665BOTTLES LINED UP  
FOR THE NEXT LOCATION. WE  
WILL SAMPLE MW35 NEXT.  
REINTS PLANS TO COLLECT  
THE DUPLICATE AT MW35.
- 1205 MW MOVES TO LANDFILL —
- 12m REINTS EXITS TO BUY ICE.
- 1232 REINTS / MW ARE AT LANDFILL  
PURGING STARTS.
- 1252 MW PULLS THE PUMP OUT OF  
THE WELL BECAUSE IT IS NOT  
WORKING PROPERLY. THE  
CONTROLLER BOX READOUT KEPT  
CAYING "OVERLOAD!"
- 1256 MW PUTS THE OTHER GRUNDFOS  
DOWN THE WELL, PUMPING WILL  
RESUME SHORTLY.
- 1356 PURGING CONTINUES AT MW35
- 1420 FIELD PARAMETERS ARE STABLE.  
SAMPLING STARTS.
- 1503 REINTS FINISHES FILLING THE  
SO<sub>2</sub>/DO<sub>2</sub> SAMPLE JARS —

R (8) 3/13/96

- 123 WED, 3/13/96 KSF
- 1512 BASIC AT SITE TRAILER, REINTS  
CALLS MRKVICKA AND UPDATES HIM ON  
SITE ACTIVITIES.
- 1545 REINTS / RAMSBY MOVE TO  
MW 10 LOCATION (PUSHKEK WILL  
FOLLOW). RAMSBY HAS WORK-  
ED ON THE GRUNDFOS THAT  
WAS NOT OPERATING PROPERLY  
AND NOW IT IS RUNNING OK.
- 1553 RAMSBY PUTS NEW POLYETHERENE  
HOSE ON THE PUMP.
- 1604 PURGING AT MW33 HAS START-  
ED. RAMSBY IS PUTTING NEW  
POLYETHYLENE HOSE ON THE PUMP  
AND LOWERING IT DOWN MW30.
- 1610 PUMPING AT MW30 HAS STARTED.  
PUSHKEK ARRIVES.
- 1720 PURGING CONTINUES —
- 1740 MW30 HAS STABILIZED SAMPLING  
STARTS, REINTS COLLECTS A SALIT.
- 1745 MW33 HAS STABILIZED IN FIELD  
READINGS NOW TOO. SAMPLE  
COLLECTION BEGINNING —
- 1811 REINTS FINISHES FILLING HER  
SAMPLE BOTTLES. DURING SAMPLING

3/13/96 KSF

124

WED 3/13/96 7:00  
 AT MW30, THE GENERATOR  
 (POWER SOURCE FOR THE  
 PUMP) RAN OUT OF GAS.  
 VOAS AND METALS HAD  
 ALREADY BEEN COLLECTED.  
 REINTS PUT HER THUMB  
 (IN A NITRILE GLOVE) OVER  
 THE END TO STOP AIR  
 FROM GETTING IN THE  
 LINE UNTIL AN ALTER-  
 NATE POWER SOURCE COULD  
 BE USED - THE SECOND  
 GENERATOR.

RAMSAY DRILLS WEEP HOLES  
 IN BOTH THE WELL'S PROTECTIVE  
 CASINGS.

1818 THE PUMP IN MW-30 IS LODGED IN  
 THE BOTTOM OF THE WELL.

1820 THE HOSE IS PULLED OUT OF THE  
 WELL, THE PUMP & WIRES ARE  
 STILL LODGED.

1825 THE PUMP IS FREE, A BAILOR  
 WAS USED TO KNOCK IT FREE

1935 REINTS OFF SITE

3/13/96

THURS, 3/14/96

125

0745 REINTS ARRIVES ONSITE  
 WEATHER: SUNNY WITH FEW CLOUDS,  
 ABOUT 45°, HEIGHTS IN THE 50°.  
 EXPECTED. WIND OUT OF THE  
 SOUTHEAST UNDER 5 MPH.

TODAY WE WILL SAMPLE MW31  
 AND MW32 AT THE MULDOUGH  
 WELL

0800 PUSHKEK IS PICKING UP GARBAGE  
 AROUND SITE TRAILER

0820 RAMSBY FILLS GENERATORS WITH  
 GAS

0830 RAMSBY PUMPS PURGE WATER INTO  
 DRUMS AT CONTAINMENT AREA.

0855 MOVING TO MW8 AREA. THE  
 ROAD ALONG THE RAILROAD TRACKS  
 IS USED INSTEAD OF GOING  
 THROUGH ACS.

0915 MW IS PUTTING PUMPS W/ NEW HOSE  
 DOWN THE WELLS

0940 PUMPING AT BOTH MW31 AND MW32  
 HAS STARTED.

1040 PURGING CONTINUES

1110 REINTS CALLS BIANCHIN AND LEAVES A  
 VOICEMAIL MESSAGE TO UPDATE HER

3/13/96

126

THURS, 3-14-96 Ky if  
ON SITE ACTIVITIES —

1120 MW32 FIELD PARAMETERS

STABILIZE, RAMSBY/REINTS  
BEGIN FILLING SAMPLE BOTTLES.

RAMSBY IS COLLECTING A  
DUPLICATE SAMPLE HERE —

1200 RAMSBY STARTS SAMPLING AT  
MW31 WHICH NOW HAS STABLE  
FIELD PARAMETERS —

GADOMSKI CALLS FROM BV  
REGARDING THE NUMBER OF  
SAMPLES BEING ANALYZED.

SAMPLE JARS ARE STILL BEING  
FILLED AT MW32 —

1225 ALL BOTTLES ARE FILLED - MW  
CLEANS UP THE AREA —

1235 REINTS IS AT ACS TURNING IN  
HER CONTRACTOR BADGE FROM  
YESTERDAY —

1245 REINTS RETURNS TO MW31/32  
LOCATION, MW PACKS UP. —

1255 REINTS EXITS

127

RJF 3/14/96

## USEPA/ARCS V BVSPC Oversight Summary

Reporting Period: Jan. 29 - Feb. 26, 1996 Hours Worked: 246

Site Name/Location: ACS/Griffith, IN BVSPC Project No.: 71670.600

USEPA Work Assignment Manager: Sheri Bianchin, RPM

Project Manager: Steve Mrkvicka

Personnel Summary Affiliation	No. of Personnel	Responsibility
Montgomery Watson	1-2	PRP Contractor
Boart Longyear	2-3	Rotosonic Drilling Subcontractor
BVSPC	1-2	USEPA Oversight Contractor

**Summary of field activities:** During the lower aquifer investigation at the American Chemical Service, Inc. (ACS) site, eight wells and three piezometers were installed. Details on installation are included in this report.

Field activities began on January 29, 1996, when 12 1/4 inch inside diameter (ID) hollow-stem augers were used to install eight inch ID steel outer casing one foot into the upper clay unit.

During rotasonic drilling, the following activities occurred. Coring began inside the 8 inch casing and continued down to the lower clay unit or bedrock. These cores were placed in plastic sleeves and then boxed in 5 foot sections. Once in the box, the cores were labeled, the plastic sleeves were cut open, and the core was logged. Montgomery Watson collected one or two samples from each section for volatile organic headspace analysis with a photoionization detector.

On February 1, 1996, rotasonic drilling began at the MW-17 location. By February 6, 1996, two piezometers and a well were completed at the location. PZ-42, screened from 80 to 85 feet; PZ-43, screened from 94 to 99 feet; and MW-28 screened from 60 to 70 feet.

Work at the MW-08 location began on February 6, 1996. Vertical profiling first occurred at this location. Profiling entailed coring a 10 foot section, collecting a

groundwater sample using a power punch, and advancing the temporary 6 inch casing to below the just sampled interval.

Sampling at all profiled wells was accomplished when a 4 foot screen was retracted inside the drilling rods at the bottom of the borehole. The rotosonic drill rig vibrated the retracted screen loose from the water-tight rods. The drill string was pulled up 4 feet exposing the screen and allowing groundwater inside. A water level indicator was used to insure the screen was open. Next, a Grundfos pump was put inside the rods 2 feet above the screen, and the borehole was purged. Montgomery Watson personnel purged at about 0.5 gallons per minute until field parameters stabilized. Once parameters stabilized, the flow rate was reduced to about 280 milliliters per minute and two 40 milliliter vials were filled with water. The samples were taken to the onsite laboratory for analysis.

The MW-08 location was completed on February 15 and included the installing monitoring wells, MW-31 and MW-32, their 10 foot screens capturing the 69 and 99 foot bbls elevations. At this point, volatile organic compounds were detected at the 69 and 99 feet intervals, so a deviation from the Scope of Work was implemented. Piezometers originally scheduled for installation at the base of the lower aquifer were to be installed as stainless steel wells with 10 foot screens.

Work began at the MW-10 location on February 19, 1996 and concluded on February 22, 1996. MW-30 and MW-33 were installed during that time.

Drillers mobilized to the MW-09 location on February 22, 1996. Indiana Department of Environmental Management representatives videotaped rotosonic and vertical profiling procedures that day. MW-29 and MW-34 were installed at the location.

A second rotosonic drill rig began drilling at the M4 location on February 23, 1996. On February 24, 1996, the oversight contractor videotaped rotasonic drilling techniques. Late on February 24, 1996, MW-35 installation was complete and the second drill rig demobilized.

Between February 24 and 26, 1996, MW-36 and PZ-44 were constructed at the MW-07 location.

Well and piezometer construction involved the following activities: lowering the well screen and riser into the borehole, capping the riser, and slowly pouring filter sand around the riser to 2 feet above the top of the screen. Next, one to two feet of fine sand was poured into the annulus before adding 3/8 inch bentonite chips for a seal. After the seal was in place, a bentonite slurry was tremied to land surface. Spot grout density checks revealed grout weight around 10.2 pounds per gallon as measured by a mud balance. Protective casings (or flush mounts in the case of MW-28, PZ-42, and PZ-43) were installed and wells were then secured with padlocks.

On February 2 Montgomery Watson personnel installed transducers on MW-07 and MW-09, and P-8. Water levels were recorded every 30 minutes for these locations and the data was downloaded every 7 to 9 days. These instruments were removed on March 3, 1996.

**Problems Encountered/Corrective Actions:** On two occasions the rotosonic drill rig had mechanical problems which resulted in a release of hydraulic oil over boreholes. To remedy the situation, hydraulic hoses were replaced. Leaking oil was soaked up with paper towels before it entered the borehole. After repairs were made, drillers flushed the boreholes thoroughly with potable water to insure that no oil remained in the borehole or on the rig.

During vertical profiling, the power punch screen clogged with fine material preventing water from entering it. After an OK from USEPA, clean filter pack sand was put inside the 4 foot screen, and the problem was solved.

On at least three occasions, the 6 to 12 inches of fine sand above the 20/30 filter sand pack specified in the SOW was not installed. This problem was resolved when more fine sand was purchased.

Signature: Matt Martin  
for Carter Helm

Date: 3-27-96

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1-29-96 Mon. C/MT ①

- 0930 Depart Home in Atlanta  
to Airport (Carton J. Helms)  
*(Note: hour charged)*
- 1300 Arrive Chicago Midway Airport  
Rent Avis car  
Travel to Griffith, IL
- 1400 Arrive at ACS; sign in at  
visitor office, meet with  
Tom Froehner, ACS Foreman  
Phil Smith, Montgomery Watson (mw);  
Go to mw/BV Trailer, meet  
L.T. Matt Masternard, BV  
Receive site details / Summary  
from M.L.H.
- 1450 Call Steve Mrkivicka, BV PM  
 ① Need to show hotel receipts  
 ② Need to shop for protective  
clothing (for cold weather)  
 ③ 5-day shift, 2 off  
 10-day shift, 4 off  
 10-day shift -  
 ④ Get Lower agency SOW/sop  
dated 1/25/96 + EPA comments  
Already reviewed 12/95 SOW  
& HASP's for ACS.

Note:

2

1 - 29 - 96

(3)

- 15:15 Depart site, Travel to Target & Senrs Dept. Store  
16:20 Get side supplies, disposable cameras, carriages, etc.  
18:15 Arrive at Hotel, the Fairfield Inn on Torrance Ave., Lansing, ILL.

4

C  
N  
E  
S

- 1 - 30 - 96 TUE. (5)  
2° F, cloudy, windy.
- 0700 Depart Hotel  
0730 Arrive on ACS site, 5155 14  
at m/w trailer  
Meet Jeff Ramsby, Mw Geologist  
and Boarit Longyear/Wisconsin  
Drillers: Paul  
Mike Magin & Todd  
800 Sit down & Safety Meeting  
plus sign Mw's HASP  
Meet Rob Lance, BL  
See Matt Washburn, BV  
Receive 1/25/96 SOL/SOP L.A.I.  
plus EPA comments 1/25/96  
for Lower Aquifer Investigation  
0840 Drillers go inside facility (ACS)  
for casing & hoses, + other supplies  
Drill Rig: Branard kilometer - 81  
or BK-81  
0915 Set-up on m/w 28 (mobilize to)  
near m/w 17 location  
10:00 Break ground for m/w 28  
using 12 1/2" I.D. HSA's, 5 foot sections  
Note: m/w 28 is n 18' North of m/w 17  
10:58 AT 15' b/s, Drillers prepare  
to split spoon 2-1/2' cores.

6

Weller

1 - 30 - 76

(7)  
C/H

Split spoons (2") will

continue until confining layer  
is reached, S.S.P. 15-17', 17.5-19.5', etc.  
per ACS' SOW for 1st boring

Page 6, 1125/76, L.A.I. S.O.W. Dammit

1100 BK-81 rig cable has become  
frozen/bound/binded up in upper  
boring pulley. Drills lower  
boring to untangle or free cable.(C/H needed to withdraw 1st  
split spoon - already driven in)1120 Cable replaced, 15-17' spoon  
Does not indicate the clay  
confining layer, weathering is  
present > 16.8' b/s, need  
another spoon1125 HSA to 17' b/s, another  
spoon driven Hammered  
Split spoon 17.5 to 19.5 - b/s

Did Not reveal the clay confining layer

Lunch break

1215 Return to MW/BV Trailer

Drillers re-loading supplies/drums

1250 Back at mnr + 28

8

C1

A100m

1 - 30 - 96

C1/9

- 12:55 H.S Augering to 20' b/s  
to take 20-22' split spoon.  
1.5' of recovery; no clay.  
Bdry some in dorsal,  
1.9' of recovery - coarse sand  
No clay
- H.S A/ to 22.5' b/s  
split spoon 22.5' to 24.5' b/s  
very coarse sand - gravel  
No clay confining layer.
- H.S A/ to 25.0' b/s  
25.5' - 27.5' b/s split spoon  
collected; No clay layer.
- H.S Auger to 27.5' b/s  
Collect 28-30' b/s spoon.  
8" carbon steel casing pieces  
measured = 21' & 22'
- Gray clay encountered at ~27.5' b/s  
according to Jeff Ramsby, since  
majority of 28-30' spoon is slough.
- 27.5' to 29.5' spoon to be  
collected to check top of clay.
- Confirmed that top of clay = 28.0' b/s  
27.5' is silty clay - just above true  
clay confining layer - see photo

13:38

13:50

10

C  
A  
S  
t  
e  
r  
r

1 - 30 - 96

(11)  
Q/H

Jeff decides to set 8" casing  
to ~~29.0' H.S.~~ 30' b.s.  
to ensure clay layer/casing  
seal.

Drillers cut 9' from the 21' section  
Lowered 22', 8" dia. section  
into borehole then Drillers

14:40 Weld 9' section on to 22' section

14:30 Push 31' casing with Drill Head  
to 21.0' <sup>abov</sup> tool surface (9' s)

#### Type I

14:40 Lonestar Portland Cement  
& Powdered GETCO "Pure Gold" High  
Solids Bentonite used/mixed with  
water to create slurry  
to grout casing in place.

14:55 Slurry transmitted up 1" steel pipe  
from bottom of borehole up  
as HSA are pulled out

6 to 6.5 gal. H<sub>2</sub>O per 1-9.4 lb bag Cement  
plus 5% bentonite (1.50 lb bags total)

slurry

mix

Done in Mid Tub.  
for Moratorium using rig pump.

10 - 9.4 lb bags

60 to 65 gal. 1.5 H<sub>2</sub>O

Cf Helms

1 - 30 - 96

(13)

- Ground casing is completed ~~at 28'~~  
 " ~~because~~ HSA boring to ~~28'~~ G.A.  
 to 3.5' b.l.s., Drillers start to  
 pull. They will "top off" after  
 grout set/r's using slurry left over  
 from 2<sup>nd</sup> or 3<sup>rd</sup> boring grout.  
 Call Steve Wirkkula to  
 report today's activities
- 1620 Dr. Drillers start 2<sup>nd</sup> borehole  
 at MW-28 location  
 HSA w/ 10 1/2" ID Augers  
 2<sup>nd</sup> Borehole is approx 5' NE of  
 1<sup>st</sup> Borehole
- 1630 Drill helpers (Mike & Todd) return  
 to site with more 8" carbon  
 steel casings.
- 1710 HSA's drilled to 28' b.l.s.
- 1715 HSA's drilled to 30' b.l.s.
- 1720 HSA's pulled up 2' to 28' b.l.s.  
 to allow slurry to drop through down  
 hollow stem.
- 1725 Weld & cut carbon steel 8" dia (TO)  
 casings.
- 1740 Set and Push casing to 30' b.l.s  
 (1.5 ft <sup>2</sup> into clay confining layer)

14

CJW  
Wheeler

1 - 30 - 96

15

For Borehole security,

Drillers place a weighted,  
upside down 55-gal drum  
over one borehole, and

750 The 2nd borehole has the  
BK-81 Drill Head lowered  
over casing stick-up

Note: 2nd Borehole outer casing  
will be grouted tomorrow.

1805 Clean up site

1825 Depart Access site

1850 Arrive Hotel

U  
~~1850~~

16

~~Wolfe~~

1 - 31 - 96 clear air 17  
Wed -10°F ~~dry~~

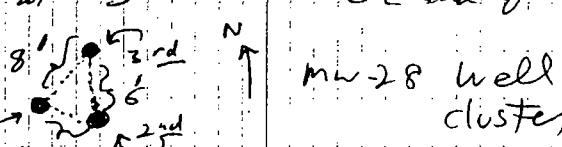
- 0700 Report Hotel  
0730 Arrive AES site  
very cold, Drillers setting  
up, getting supplies  
0800 Drive to mire-28 area  
No activity, rig not warming  
up.  
Return to site trailer  
Call BV - Atlanta to deck-is  
At mire 28 Locality, rig  
warming up, prep to grout  
casing in 2<sup>nd</sup> borehole  
Hoses & connections are  
frozen - Drillers use  
blow-torches to thaw them  
0915 Grout mixing starts  
Checking 1<sup>st</sup> borehole, Yesterday's  
grout has settled to ~ 12' bls  
(from 4' 5/8).  
0930 Drillers add more slurry/grout to  
1<sup>st</sup> borehole to bring grout up to  
~ 1' bls.  
The rest of grout used in 2<sup>nd</sup> borehole  
Note: Cement/Bentonite mixed in  
accordance to SOW/sop  
recipe Tab B, pp 5, 8.

18

*Weller*

1-31-96

C1  
19

- 10:00 2<sup>nd</sup> batch of slurry mixed  
 10:20 As HSA augers pulled out of  
     2<sup>nd</sup> borehole, drillers remove  
     slurry at base of annular space.  
 11:05 Grouting of 2<sup>nd</sup> borehole  
     complete, top of slurry = 1 bbls.  
     Drillers leave area to prepare  
 11:25 for 3<sup>rd</sup> borehole at MW-28.  
     Casing, drums, motor, etc.  
     removed by Longyear Drillers  
 12:00 Hollow stem augering starts  
     at 3<sup>rd</sup> borehole (and final)  
  
 12:40 12 1/4" ID Hollow stem augering  
     to 28' bbls, begin to cut and  
     weld carbon steel, 8" ID, casing  
     Casing "pushed" into clay  
     layer ~ 1.5'.  
 13:00 Drillers leave to purchase more  
     Portland Cement needed to grout  
     3<sup>rd</sup> borehole casing.

1 - 31 - 96

21

CJM

- 310 Return to side trailer,  
call Steve Murchie, BV to discuss activities.
- 320 Speak to Rob Lance concerning  
Confining clay layer integrity,  
ASC Production wells, Data loggers / Hermit  
start-up (ASAP) PRP & EPA  
concerns of the Lower Aquifer.
- (400) I speak to Jeff about 30-day data (Hermit)
- 1415 Jeff calls Peter Vogt to  
inquire whereabouts of  
Hermit Data loggers for  
MW-7, MW-9, P-08 for  
30 day study (but download  
every 7 days per SOLO).
- 1500 Return to MW-28 Locality, drillers  
still not onsite.
- 1515 Drillers return. Begin mixing grout
- 1550 Drillers begin grouting and removal of H5A
- 1615 Call Sheri Bianchin, EPA, left Vaca Mtn. mess.  
Notify Rob Lance of first time in  
EPA Siberians. Stop to help  
Tire changed, back to MW-28 locate.
- 1700 Wrap-up, Depart site.
- 1800

CJM

22

*Ch  
Selby*

2 - 1 - 96 Thu

23  
*JULY*

-5° F, clear

0710 Report Hotel  
0745 Arrive on site, meet with  
Peter Vogt, plus three  
new drillers from  
Boart Longyear, Wisconsin Division.

Rotosonic Drilling crew:

Jim Daccotte, Drillen  
Mike Check (zech),  
Shaun Lyneniski,  
From Boart Longyear Drilling Sys.

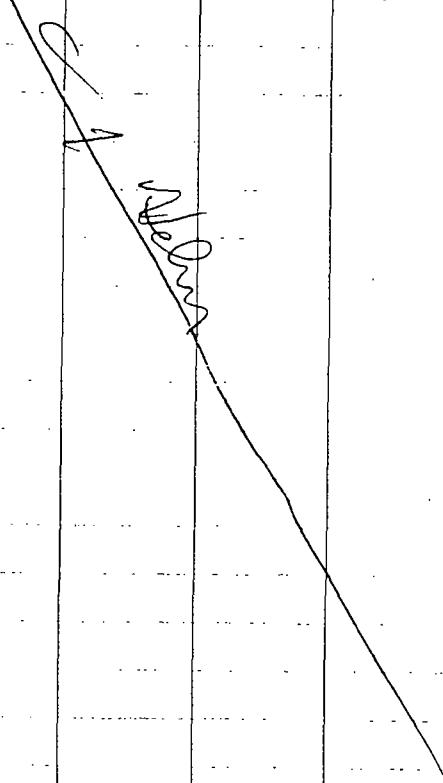
0815 Discuss Sow with Jim D.,  
he has not seen it, I said  
I could make copies for him  
and his crew.

0830 Rotosonic drill rig mobilizes  
to m-w-28 locale; Jim  
cuts 8" casing stick-ups  
to suit his equipment

0900 Two support trucks arrive at m-w-28  
Set-up begins, No M-W Geologist  
on site

0930 Jeff Ramsby, M-W Geologist on site  
set-up continues

24



2-1-96

01/01  
25

HSA core and rig set up at  
approx location & place 8" casing at ~15' bsl.

(0:10) Casing starts at Northern-most borehole.  
6:30 1<sup>st</sup> core taken (from 30-35' bsl)

Plastic bag sleeve used to  
withdraw/capture core withdrawn  
from core (2 boxes needed  
due to elasticity of clay)

10:10 Jeff collects sample near top  
(30-31-3/3), places in 4 oz  
jar, covers w/ foil & screws  
lid on. He also keeps a  
boring log - per 50m.

Note: core sample is 4" dia.

Core extracts 35-45' bsl core.  
sample is still grey clay  
Jeff states that one sample per  
core will be taken from clay.  
Once out of layer of clay, he will  
collect 1-3 samples per core depending  
on visible carbonization or litho change

Note: Due to the extreme cold,  
Jeff will take sealed samples to  
the trailer to warm them to room  
temperature prior to PIA readings.  
I concur with this.

26

2-1-76

21

1120

45-55' b/s core sample collected. Note: Jeff is staying consistent with sampling at the top of each core.

Note: No vertical Gondwanar profiling at m.v.-28.

55+65' b/s core collected.

Note: Clay confining layer ended at 59' b/s after an approximate thickness of 31'.

1140 Peter Vogt on site (m.v.-28 corade)

1210 " " offsite

1215 65+75' b/s core collected

1245 Call BL - Atlanta to report hours.

1300 Call Sheri Bianchini but her voice mail states that she will not be in till tomorrow, I'll try them

8.5-95' core sp. cut collected

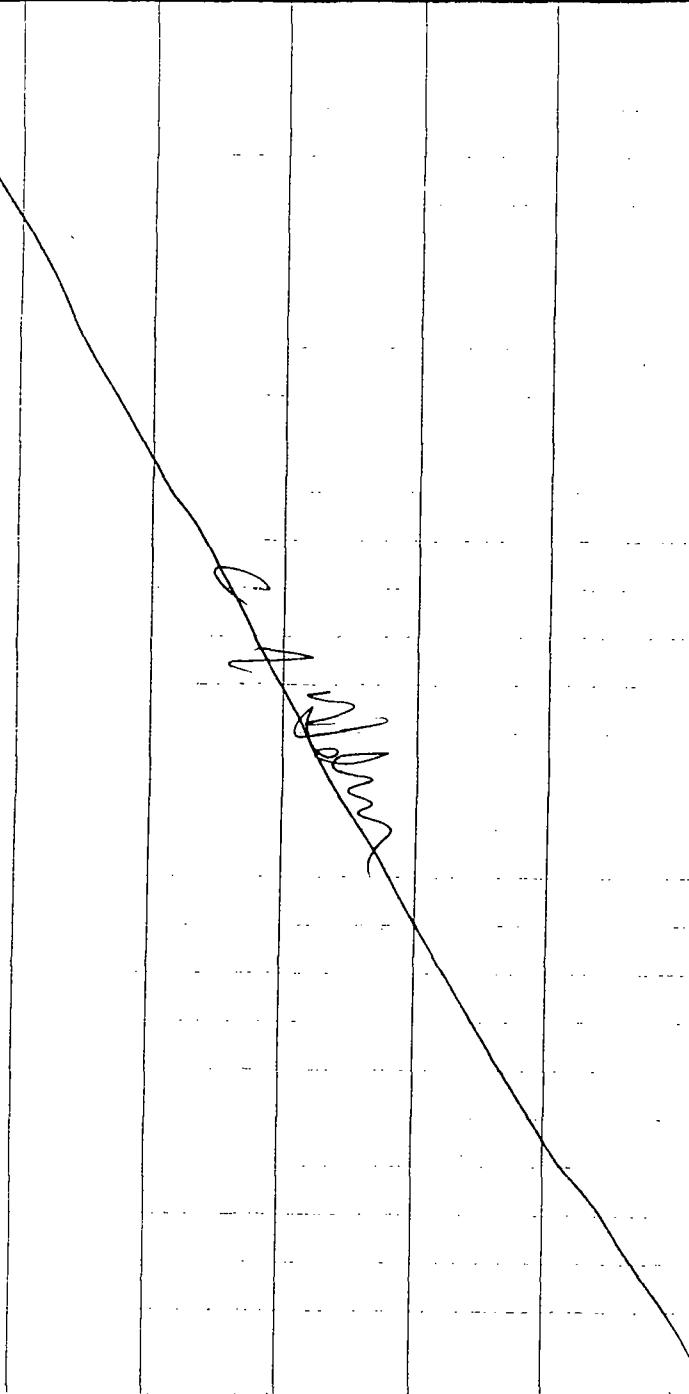
Jeff has been taking P.D. samples of 2 or 3 per 10' core

1425 105-110' core collected

Note: at 99' a clay was encountered  
Jeff calls Pete - a shale (blackish) was encountered at 108' b/s

500

28



2 - 96

29

1515 Doff measures to bottom of borehole.  
111' bds.

R I Report cross-sections that reveal shale on top of dolomite bedrock.

5.4 cu shales on bed rock  
encountered. 2' P. c. zone tr. w/  
5' screen, PVC, will be  
seated on clay, i.e., kentonite.  
Chips back filled to 101' bds

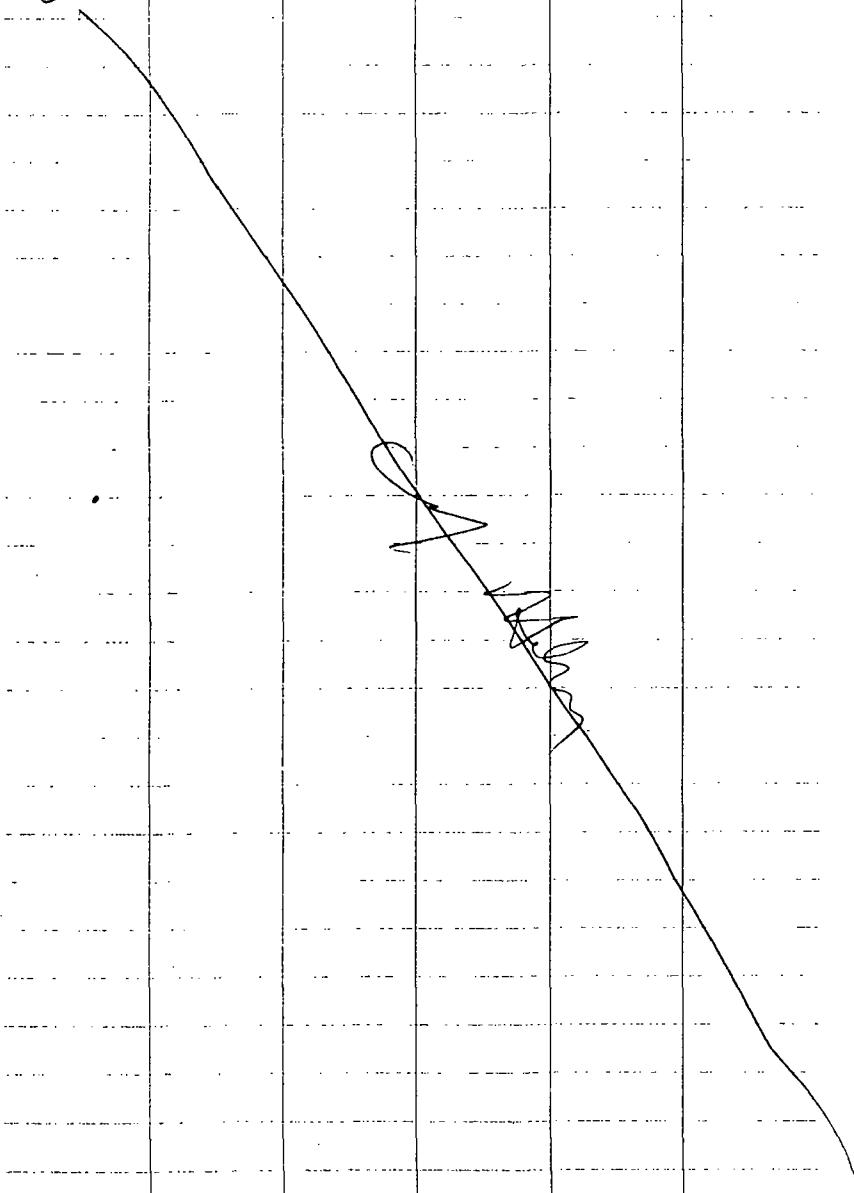
1530 Drillers leave to get well construction materials

1600 Call Steve Markovich to update him.

1615 Sheri, Blanchin, EPA, onsite  
at mw28 locale, I inquire about  
EPA's position on these issues:

- ① Can drillers drill between clusters  
locations vs. devon between each  
borehole. EPA says "OK"
- ② Is there a minimum or maximum  
distance between individual boreholes  
at a location cluster. EPA says  
keep 3 boreholes within 10' of each other.

30



2 - 1 - 96

CJH  
31

- (3) Use of lig. methanol and windshield wiper fluid as an ant-freeze in Drill Rig's gear pump.  
EPA will inquire with their technical department & get back to me.
- (4) Road to new 10 cluster is about supporting HSA dr. II Rig - Dr. Liers request using crushed limestone to pave dirt road to support drill rigs  
EPA will get back to Black & Veatch.
- Notes  
 b(5) Teleconference meeting with EPA, Black & Veatch, Montgomery-Watson scheduled for 2:30 Wed 1/2/96.
- (6) Sheri wants daily "summary" phone calls from Black & Veatch on each fieldworkday  
Jeff & Drillers Jim decide to set well tomorrow, Jeff takes samples to Trailers to warm them up before P10 readings  
Drillers prepare to use bentonite chips to raise bottom of borehole to 101' ft b.s.  
Tape measure used to determine top-of-bentonite base plug.

32

2-1-96

33

1810 Back at trailer to screen samples w/ M PID - Thermo Instrument Model 580B  
After samples have warmed up. A total of 13 samples were screened (handspace).

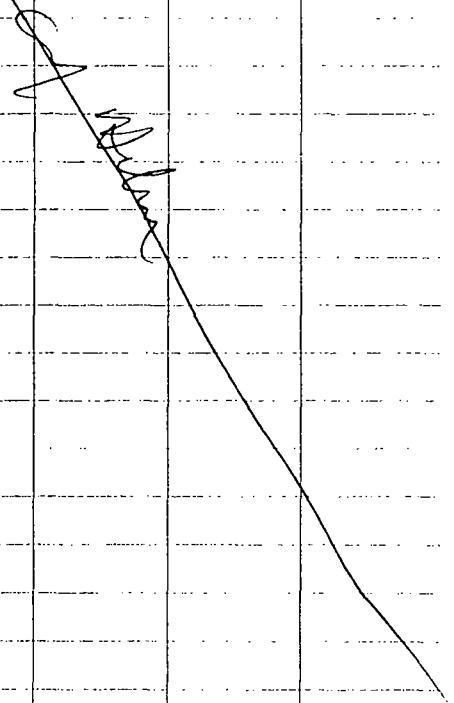
Mostly non-detect, highest value = 3.3 ppm for the 546 sample.

1815 Sher, Bissonette, EPA departs site.

1845 C. Helm departs site.

1905 C. Helm arrives at hotel

34



Fri

2-2

-96

-19°F, clear

8/35

- 0700 Report Hotel for ASC site.
- 0730 Arrive onsite. Very, very cold  
wind chill = -48°F
- 0810 Drillers get water for water  
truck which is emptied every  
night to avoid freezing.  
Jeff photographs yesterdays  
core samples with appropriate  
labels to identify each core  
indical & top or bottom orientation.
- 0900 Set up at 1st borehole at  
nm-28 locale, Drillers  
prepare to set picometer  
at bottom of lower aquifer.  
Drillers thaw out hydraulic lines  
and work area with propane torches.
- 10:00 Jeff measures screen, riser per SOW.  
10:15 Picometer constructed & placed down borehole.  
Sand-pack placement poured and  
measured often w/ tape measure.  
Total depth = 99.4'LLS, sand to 90.0'LLS
- 10:45 Bentonite hole plug used as seal  
3/8" chips - on top of fine sand which  
was placed on top of sand pack.
- Note: Sow error Tab B, pg 17, fine sand placement

36

2 - 2 - 96

C/14  
37

- 11:30 Begins mixing bentonite grout (slurry)  
Grout from 84' b/s to 2' a/s.  
1300 riser (PVC) cut to ~ 2.5' a/s.  
Note: An expendable, sealed well cap was in place at top of well during entire time of well construction. — Per S.O.W.  
1400 Called Steve Minkwicki, informed him that work has stopped at A.C.S until Monday. Give summary.  
1435 Called Sheri Blanchard, no answer — left message of today's activities at A.C.S.  
1500 Oversight completed at ACS site until mobilization on Monday, 2/5/96. Note: Phil Smith and Tom Duscheck install Hermit Dot Loggers in min-7, min-9, P8, after conducting calibration drift tests.

See Tab 'E'

~~Wells of S.O.W.~~

38

Cut  
Wells

2-5-96 Mon *CP 24*  
11°, clear *39*

0700 Depart Hotel to return  
Avis rental car and switch out  
for an EPA vehicle to save \$.  
Traffic very heavy, plus accidents.

10:00 Return Avis rental car  
at Chicago's O'Hare Airport  
Taxi over to Harrison & Arondale  
to pick up EPA 740 van.

12:00 Return to A.C.S. site  
Drillers begin sand pack placement  
for piezometer PZ-47,  
Total depth = 85' 6 1/2'  
PVC, 5' screen (10 slot)  
Johnson's "Global" sand #7  
used for sand pack

↑      ○ ← PZ-48 (99' 6 1/2')

N      ○ ← PZ-47 (85' 6 1/2')

MW-28      Note clay containing layer  
(70' 6 1/2') extends to 59' 6 1/2'.  
10' screen

Note: All ACS drillers have been using  
water from production well onsite = less  
been found to contain PCE. Now  
all water must be obtained from  
city of Griffith water supply

40

2 - 5 - 96

9/11  
41

PZ - 47 left 85' b/s total depth  
 (determining to be the center  
 of lower aquifer by taking  
 difference of PZ - 48 + mu - 28)  
 Sand pack placed to 77' b/s  
 ~2' extra sand pack above top  
 of screen = because drillers  
 did not have fine sand for  
 this borehole location.

- 1510 Bentonite seal / plug placed  
 using 3/8" pure bentonite chips.  
 Top of bentonite = 72.0' b/s  
 for a total 5' plug.
- 1525 Begin mixing pure bentonite  
 slurry to go into annulus  
 as a filter spacer (72.0' to 0' b/s)  
 Move to mu - 28 borehole, begin  
 Rotosonic coring to 70.0' b/s
- 1705 mu 28 total depth = 70.0' b/s  
 Sand pack placement up to 58' b/s  
 Bentonite 3/8" chip placed to 53' b/s  
 for a total of 5' of seal above sand-pack  
 Tomorrow we will finish well by adding more
- 1830 Report site
- 1900 Arrive at Hotel

~~John~~

92

2 - 6 - 96

30°, cloudy

43

- 0730 Report Hotel for ACS side.  
0800 Arrive at site  
0830 Drillers filled water truck  
with water from production  
well on site. They can not  
use this water & must  
depart to obtain City water  
(After rinsing their tank  
out first.)  
0945 Re-mobilize to min + 28.  
Begin mixing pure bentonite  
slurry to place from dry of  
sand to ~~and~~ <sup>1st</sup> 26 bts.  
Casing being pulled out slowly  
while sand is returned to bottom  
of annular space ~ 53' 315  
10 Grout complete at min + 28.  
11 45 Drillers demobilize — a load of  
spilled grout & water have frozen  
in yard - need to clean up later.  
12 10 Thorough decommissioning of tools,  
casing, core barrel, rods,  
support truck, drill rig  
13 00 Call Bob Marbury, Black & Veatch  
Atlanta Supervisor.

94

2-6-96

45

- 1345 Drillers still decommissioning &  
down time until  
Sign-in at ACS office  
Mobile 124 or the mnr 8  
Location  
Begin set-up on cased  
borehole.  
The 8" ID, carbon steel  
casings (2) were being cut  
by drillers to accommodate their  
wash tee.
- 1600 A tree is blocking the rig  
setup - Jeff leaves site for  
a chainsaw.
- 1620 While lowering the drilling platform,  
a hydraulic hose bursts, spewing  
oil over work - gear  
Borehole is covered while  
clean-up ensues
- 1700 Drillers dep't site
- 1730 C. Helm departs site
- 1800 C. Helm arrives Hotel.

J.W.H.

96

2 - 7 - 96

Wed.

40°, cloudy

CPL  
47

- 0730 Report dictated
- 0750 Arrive at ACS site  
D. H. L. & crew to pick up  
hydraulic hose. Down time
- 0815 Jeff assists w/m. Local B  
air - cascade system, mouth  
Mashernack is EPA oversight
- 9:10 Call Stone marker to  
bring him in of current  
situation at ACS
- 11:00 Repairs are complete, drillers  
re-entered to MW-8 locale
- I meet with Peter Vast concerning  
drillers lack of fine sand for  
top of pit (sand) - also to  
verify the "mis print" on  
Tab B, p. 7, Gc. He said  
Global delivered shipment  
yesterday including proper sand  
size material. Vast verifies error.
- 11:25 AT MW-8 locale, Drillers begin  
core w/B coring start = top of  
clay which has been cored to 20.5' SLS
- 11:40 1st core collected from 20.5' to 25.0' SLS
- 12:05 25-35' core collected & boxed w/plastic  
sleeve
- 12:30 35-45' core collected " " "

48

2-7-96

49

~~944~~  
Clay containing layer extends from 19' to 35' b/s at MW-08 locate.

12:50 Sampling point at 39' b/s  
Water level indicates down casing 19'. 3' b/s static water level noted.

13:00 Grundfos pump (new) is pulled out but has No. plug & attachment. Grundfos BM 1mp-1 - 230 V will be used downhole for slurry. Jeff has been collecting samples for P.I.D readings and will bring his instruments for pH, conductivity, TUR, turbidity, readings.

Dr. Miles is here to fit Grundfos  
Note: Paste cast on site.

Documentation till electrical plug is attached...

14:25 Drillers return, I depart MW-8 to participate in tele-conference call issues addressed include: slurry well investigation = correct offsets & onsite well, upper Aquifer investigation, Lower aquifer investigation, PCE in onsite prod. well.

CJ  
Stetson

2-7-96

Jeff  
51

1540 Teleconference concluded.  
I mobilize to NW-8 location.  
Jeff reports that before 1st  
17' interval was sampled (vertical profile)  
He had an equipment blank  
then tubing/pump etc. to key  
and used with Field Lab G.C. at  
sample was then collected (.5g/m)  
from 3.9' b.s. Very silty,  
but parameters did stabilize >600  
except turbidity = unreliable. NTU  
Drillers extract sampling point  
and clean with rig water  
before Jeff decons it  
(Field decon set + up)

Note: equipment blank  
Not run thru point + screen  
I will recommend an Equip.  
Blank for this equipment  
after field decon procedures  
1600 Drillers cannot free the point, i.e.,  
screen exposed, will not retract.  
After using a hammer, drillers  
free the point, re-decon, then  
insert back in to core rods.

1550

1600

1612

~~C~~  
~~W~~

52

2-7-96

CPL  
53

Note: Core 45-55' b/s

has not been taken

1620 but Point & screen  
lowered (4' below  
bottom of last core run)

Submersible pump & rose lowered  
to 44.5' b/s, 2' above screen

Low flow purging begins

9 sets of parameters taken

Stabilization reached

Final Turbidity = 60 NTC's

At 300 ml/min approx. flow  
rate, Min. filled 2-40 ml vials

for VOC's (for Field GC 1,6)

Report m-8 location

Arrive at Hotel.

*J. J. Vatels*

*Next*

2-8-96

Thur.

55

48° cloudy

- 0810 Back at un-08 location  
Drillers begin re-drilling  
0825 Core from 45' to 55' b/s  
collected w/ 3" core barrel  
0900 Inserting vertical profiling  
point and screen to 59' b/s  
0915 Insert subm. pump to 54' b/s  
Note: 20' core sample + s  
collected (45'-55', 55'-65' b/s)  
Not in SAW } to save time during vertical  
needs EPA } profiling, after 59' screen  
approval } setting, drillers can immediately  
re-set screen (after down)  
to next interval - 69' b/s  
0950 Pump is Not able to purge  
due to high silt content. No re-bore  
Point's screen is getting clogged  
with silt. M-W (Jeff) wants  
permission to use boaters or  
put a temporary sand pile inside  
around screen as well as in  
screen. Rob Lance on site, we  
need EPA approval for: ① 20' A-Holes  
and ② alternative vertical profile method  
due to fine sand clogging screen above point.

56

2-8-96

57

53' 515 "blowin"  
59' 515 to fire 55 and  
48' 515 point, therefore  
48 - 515 water (static) head  
3.5 - 4.5' of water column  
but we need in excess of 720' H2O

After several attempts,  
including shortening the pump's  
hose to reduce vacuum needed  
to pull water up no purge possible.

11:00 Back at trailer - Jeff, Rob, Carter

11:15 Spoke to Steve Mangion  
EPA Hydrogeologist, stated

that Monty-Watson can not  
strike down the rock, that  
"screening records. No lower  
aquifer contamination."

Steve Mangion & Rob Lance offer  
new technique of: slowly  
raise screen to allow aquifer  
flow into point's screen.

Other options ~~sand filled~~  
~~baffles~~ need  
approval from more people  
Not just Steve, but I DEC &  
EPA's RPN & Pete Vast (etc.)  
needs to be filled in, however)

2 - 8 - 96

8/59

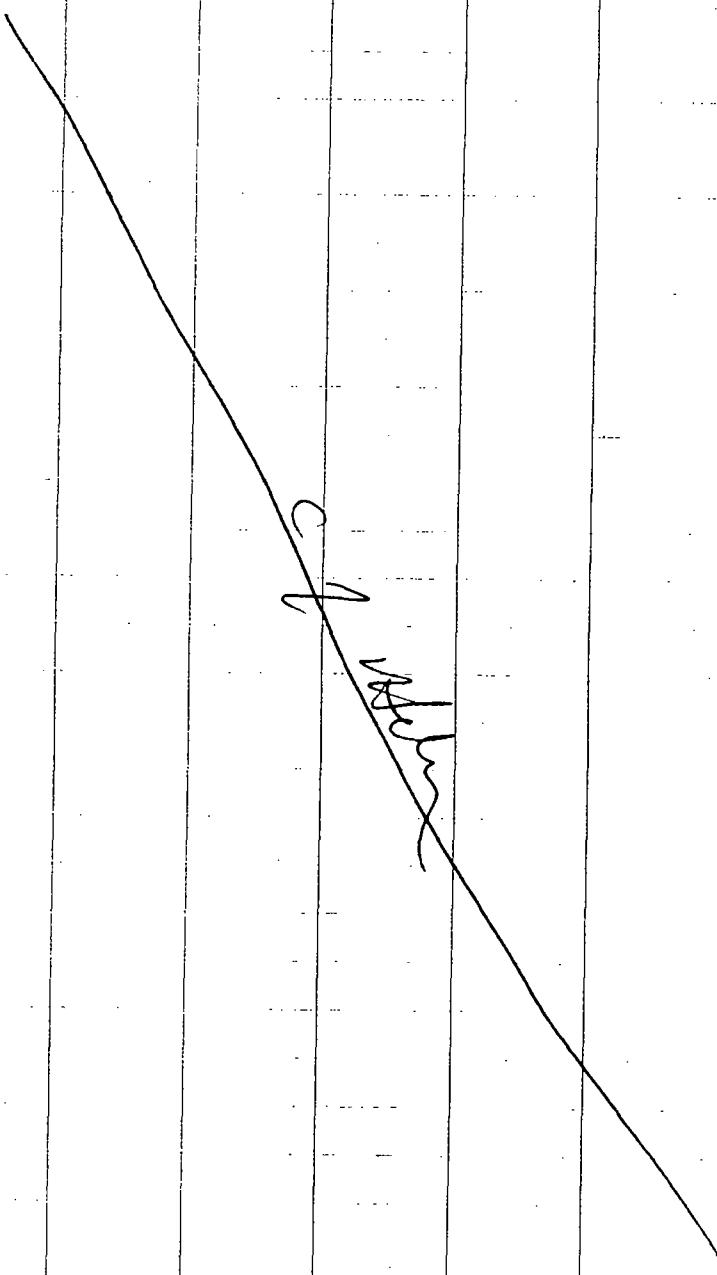
Stone approves the sand method in vertical profiling but No Boiling EPA ok's the use of clean filter sand on the inside of drillers screen prior to lowering point to sampling interval.

- 1155 Rob Lance calls Steve Mrkwicky
- slot size is 16", needs to be smaller to prevent sand intrusion
  - No more 20' core intervals
  - must stick to 10' which states 10' core lengths, then sample for vertical profile.
  - use ~ $\frac{1}{2}$ " deplon tubing not garden hose size tubing which we are currently using.

12 20 I speak to Jeff Lansby, he states that drillers will use 10' core lengths - no greater, even though it may be thicker ~ That is not a factor.

- 1245 Prior to lowering screen & point to 51' interval, drillers fill inside of screen with clean sand.
- 1255 Lower point screen to 55-59' b/s.

60



2-8-96

Off 61

- 1300 With a 4' column of filter pack sand inside the screen, purge is now successful at the 59' b/s interval. Water level indicates 20' column of H<sub>2</sub>O.
- 7 Sets of parameters taken before collecting 2-VOA wigs at ~300 ml/minute
- 1310 113 NTU's turbidity  
8.41 pH  
210 mhos conductivity  
11.5°C Temperature
- 59' BLS sample
- First Parameters ←
- 1345 Push casing to 55' b/s
- 1400 4. Reducer core barrel  
extrude core sample (55-65' b/s)  
To follow down, drillers core another 10' core, 65-75' b/s, in order to sample at the 69'  
Vertical depth interval (65-69')  
extrude 65-75' b/s core  
Lower point to screen to 69' b/s  
Begin purge - low flow  
Final parameters: 217 Turbidity,  
after 8 sets are 8.3 pH, 200 mhos, 11.0°C  
Temp.

62

~~Weller~~

2-8-16

63

- 15:27 Sample collected (67' 51s)  
15:40 Jeff runs samples over  
to GC (6s)  
16:10 core collected (pushed) and  
casing drawn down to 79'  
16:20 extracted (75-85' 51s)  
Por recovery (3')  
Lower screen and point to just  
cored interval, 75-79' bbs  
Begin purge at the 79' interval  
at approximately  $\frac{1}{2}$  ml/min.  
17:05 Collect the 79' (75-79')  
gw sample (2 min's)  
using a flow rate of approx.  
2.80 ml/min.  
Jeff takes vials to trailer  
Depart site  
Arrive at Hotel
- ~~CJ Hether~~

64

~~C~~  
~~Wells~~

2-9-96 Fri.

29°  
65  
clear

- 0715 Report Hotel  
Arrive at ACS site  
0745 AT min 8 locations,  
drillers setting up  
to continue vertical profiling  
and coring. Rig gets  
re-fueled (in place), water  
truck refilled, under hoses  
in between, warm-up big motor.  
0840 Lower core barrel and core (partially)  
the 85 to 95' b/s interval,  
while full core is down-hole,  
drillers drive casing to 85' b/s  
0900 After casing driven to 85' s/s,  
drillers push core barrel to 95'  
(to finish the coring).  
Withdraw core rods & barrel  
Insert point & screen sampler  
(just deconned) and lowered  
to 89' b/s (pulled up to  
expose 4' screen 85-89' interval)  
Note: P.F.O screening of soil  
sample from 4' has been non-detect.  
However, GC indicated ~5-6 ppb  
of 1,2,4-cis DCE at 69' s/s  
groundwater sampling interval.

2-9-76

cycle  
67

- 925 Drillers remove point & screen, Then raise & lower casing to knock down blow-in material.
- 930 Casing (bottom of) returned to 85' b/s.
- 935 Drillers re-lower point & screen + rods.
- 945 Point is driven to 89' b/s and sheath slowly pulled up 4' to expose screen.
- 950 Pump is lowered to a 83.5' b/s
- 952 Purge begins at approx ± 30 l/min but sampling flow will be 200 - 300 ml/min per 50m.
- 10.08 Purge ends, flow rate dropped to 250 ml/min, Turbidity = 85 NTU's
- 10.11 VDT sample collected for 89' b/s
- 10.15 Pump withdrawn from hole, cleaned using Rig water tank while Jeff uses EPA van to run these samples to the field GC lab.
- 10.22 Drillers withdraw rods & sampler. Empty screen of sand pack, shoot water thru it, then decom. it.

2-9-96

69

Sampling point 1 screen  
wrapped after decom (is plastic)

10:40 Core barrel lowered into  
borehole.

10:45 Casing then driven to 95' b/s

11:00 Mike Fellas and Pete Vist  
(Montgomery - Watson)  
on site to check on progress.

11:10 Withdrawn then 95-105' core  
95-103 was corcd interval  
Not 105'

Clay encountered at 99.5 b/s  
according to this core.

11:30 No more coring, no more (today)  
water sampling due to top of clay  
or some problem. Sampling interval

11:45 until  
12:00 Clean-up, shut down begins.  
To be continued Mon ~12:00.

13:10 Travel back to hotel to  
make phone call & notes, pack up.

14:00 Speak to Steve McKeever to inform  
him of today's activities & next  
week's schedule

15:00 Call Shari Bianchini - leave message  
on her voice mail. Travel Time

to 19:15

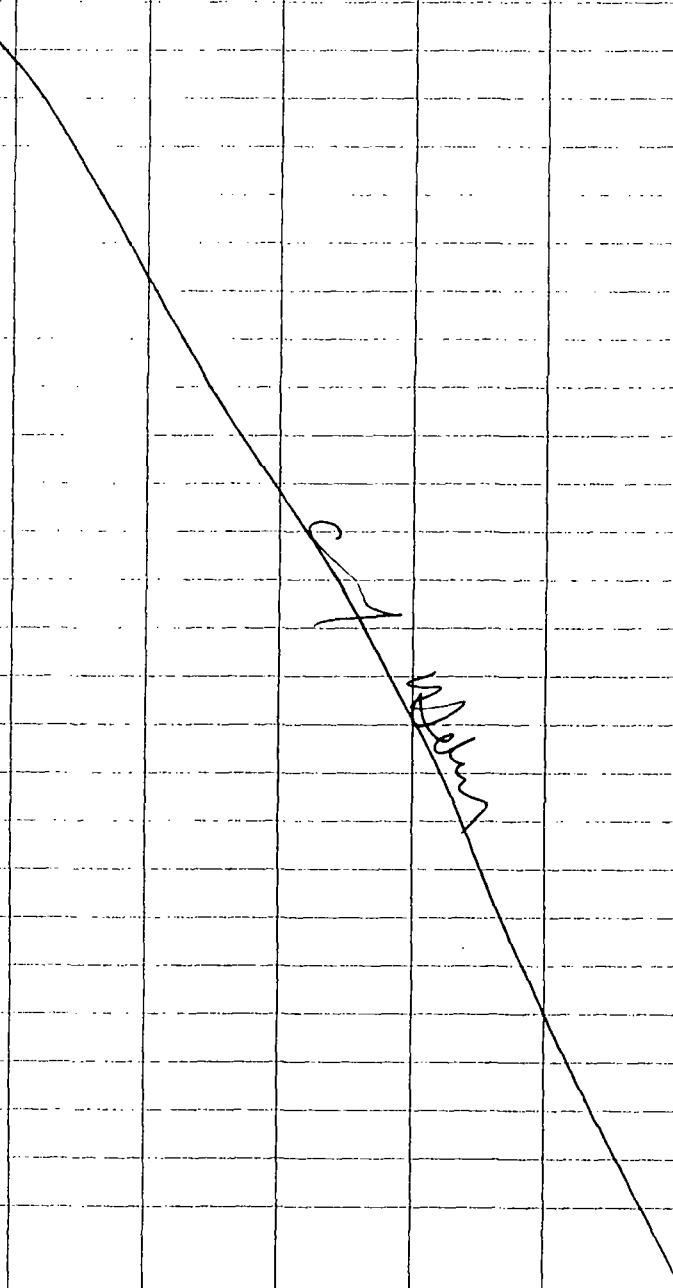
~~CJ 2/8/96 return to Atlanta, GA~~

2-12-96 mon

71

22°, clear

- 0715 Report Home in Atlanta  
to Airport
- 0815 Arrive at Airport
- 0915 Fly to midway, Chicago
- 1100 Arrive in Chicago
- 1200 Drive to Hotel
- 1300 ATT ACS site, Drillers  
missed their plane & will  
be late - Down time...
- 1415 Drillers Jim & Steve  
arrive at site trail 11
- 1430 Load up support truck w/ supplies
- 1445 Midway to 1100-8 1000ft
- 1530 After raising & lowering the  
casing so 100ers heated  
sands, casing returned  
to 9 1/2' b/s Screen filled w/ sand.
- 1540 Drillers lower screen &  
paint (decorated Fri.) to 9 9 1/2'  
Drillers expose screen  
to 9 5' to 9 9' b/s interval
- Drillers lower pump  
to ~ 9 3.5 / 5 1/2'.
- 1550 Pump is overheating, and  
No flow is evident at this time

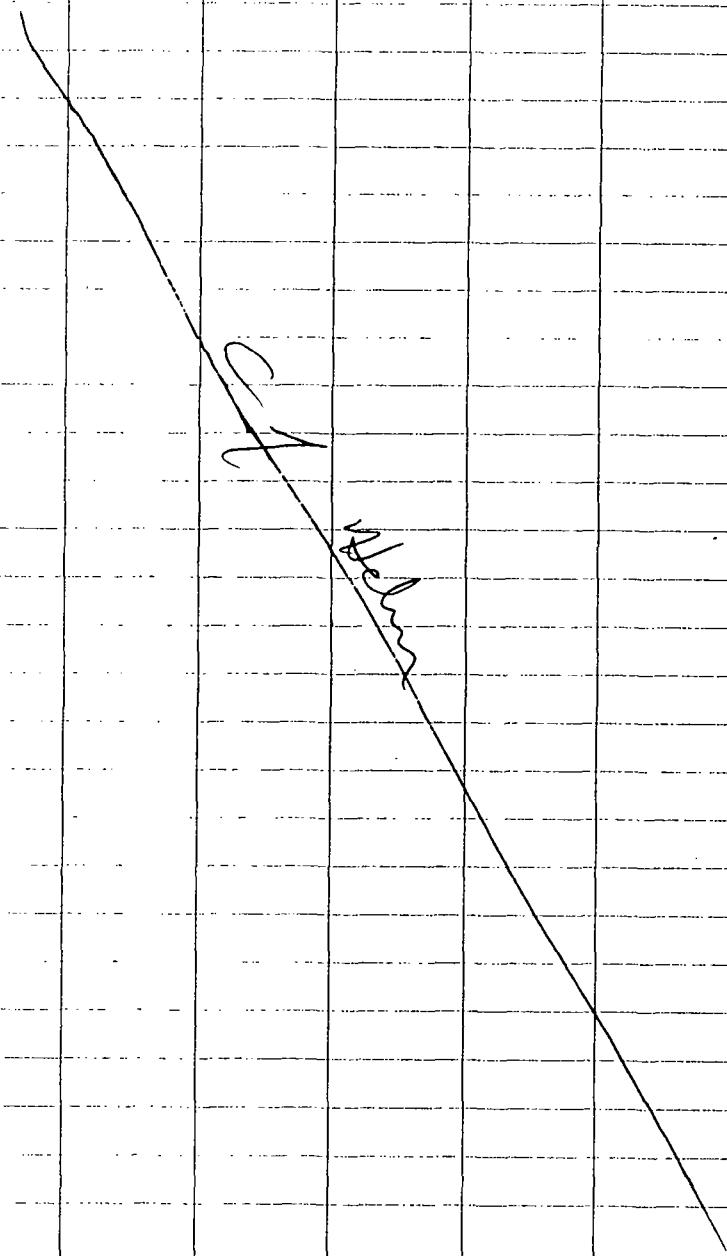


2-12-96

73

- 16:00 I suggest using water-level indicator to check if screen had opened.  
M-W's Jeff does and finds no water in rods, at least we know we have water-tight connections to the screened interval, but screen needs to open.  
Pump is tested in tub of water - inoperable - perhaps burned out from running it in a "dry hole"  
16:05 Jeff and drillers take apart pump to free impellers of sand & silt  
16:45 Grundfos pump is now operable, now we need to ensure that screen is open.  
16:50 Drillers ready to drive point in order to expose screen.  
17:10 Screen is finally exposed after three attempts to open screen. Water level measurements collected to monitor static water level in drill rods.

74



2 - 12 - 96

~~C 75~~

1720 Purge begins at 99' 6 1/5  
interval (95' - 97' 5 1/5)  
at 1/2 gal per minute  
while parameters are checked  
by M.W.'s Jeff Ramsby

After 9 sets of parameters  
The final set:

114 NTUS Turbidity

8.73 pH, 8.0°C Temp  
and 230 mµmhos conductivity

1732 Flow reduced to 280 ml/min

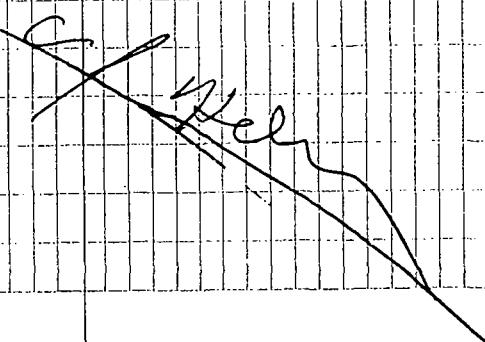
1735 99' 6 1/5 sample collected

2 vials filled - No air  
bubbles, slopes changed, etc.

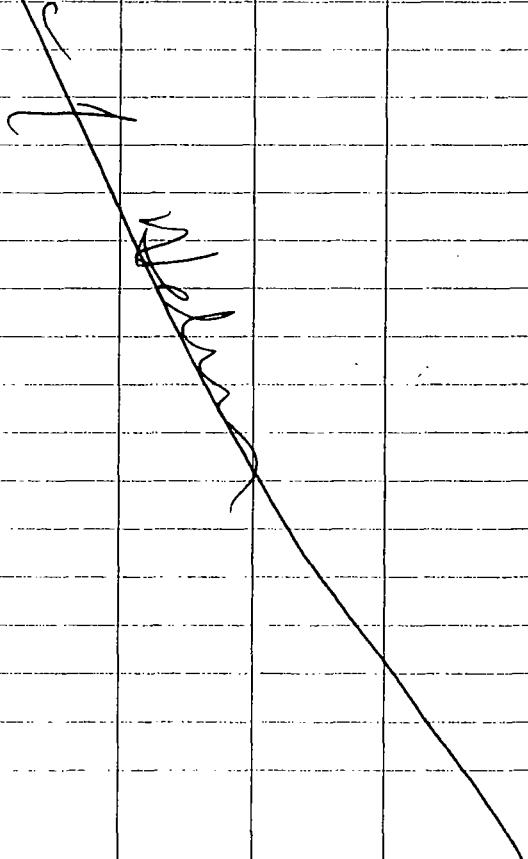
1802 Take water samples to trailer

1815 Depart ACS site

1845 Arrive at Hotel



76



TUE 2-13-96

77

25°, cloudy

0710 Report started

0730 Arrive at site

0745 Drillers are preparing

to set piezometer

PZ-44 in lower zone

of Lower Aquifer. It will be  
1" PVC w/ 5-foot screenper 50'. Borehole flushed out  
prior to piezometer installation.  
1" PVC 5' screen + 10' risers measured.

825 Installing PZ-44 to 99.0'

b/s., Pour sand-pack from  
99.5' to 96.0' b/s.

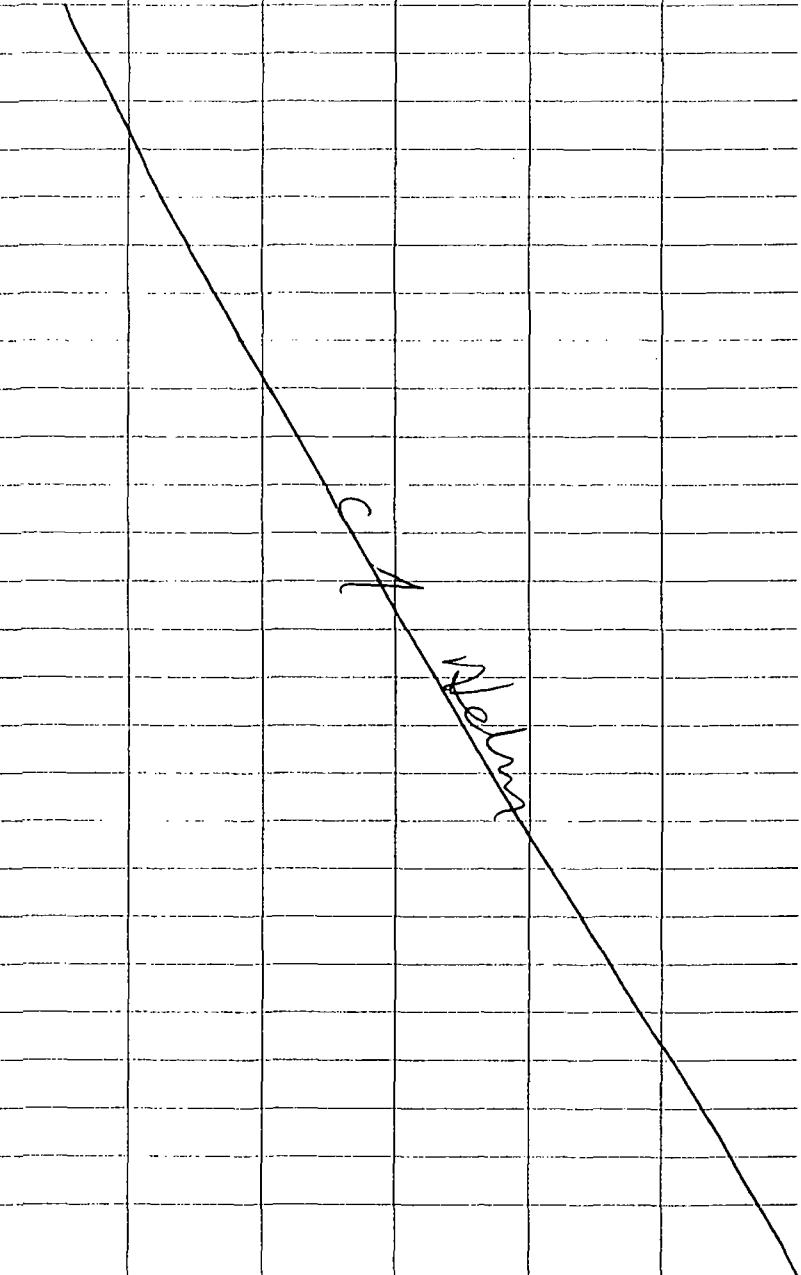
Begin lifting art casing

855 Top of sand pack at 91' b/s,  
3' above top of screen. No  
fine sand used above sand pack.  
3/8" bentonite chips packed on  
top of sand pack

900 5' of hole plug to 86.0' b/s

Note: M-W geologist, Jeff, has  
not been on site until now.910 GROUT (bentonite slurry) mixing  
begins. Drillers use recipe in SoW.

78



2 - 13 - 96

JG  
SG

Pure bentonite silty gray grout  
traveled from bottom to ~8' b/s.  
Drillers will top-off later when  
drilling the well located ~3'  
North of PZ-44 location.

1000 Drillers begin to relocate to  
the MU-31 location 1' north  
of PZ-44 location.

11:15 Begin coring thru set casing (8')  
of MU-31 borehole 20.5' - 30.5' S/S

11:20 Advance casing (5") alternating  
with core advancement  
until casing is seated  
at 60' b/s and core barrel  
seated (settling) at ~64' b/s

13:30 When drillers noticed  
a hydraulic fluid leak / break  
coming from tub or head  
vents, head is overheatting  
Drilling stops while Jim makes  
a phone call - He thinks an air  
spring broke inside tub / head.

Boat-Langyear makes  
arrangements for immediate  
repair or replacement.

or both -

2-13-96

81

Mr. Zales Davidson,  
Boat Longyear field  
mechanic will be here  
in the morning to  
hopefully repairing fly head.

Limited use of drives is still  
possible. Rags used to prevent oil drips.

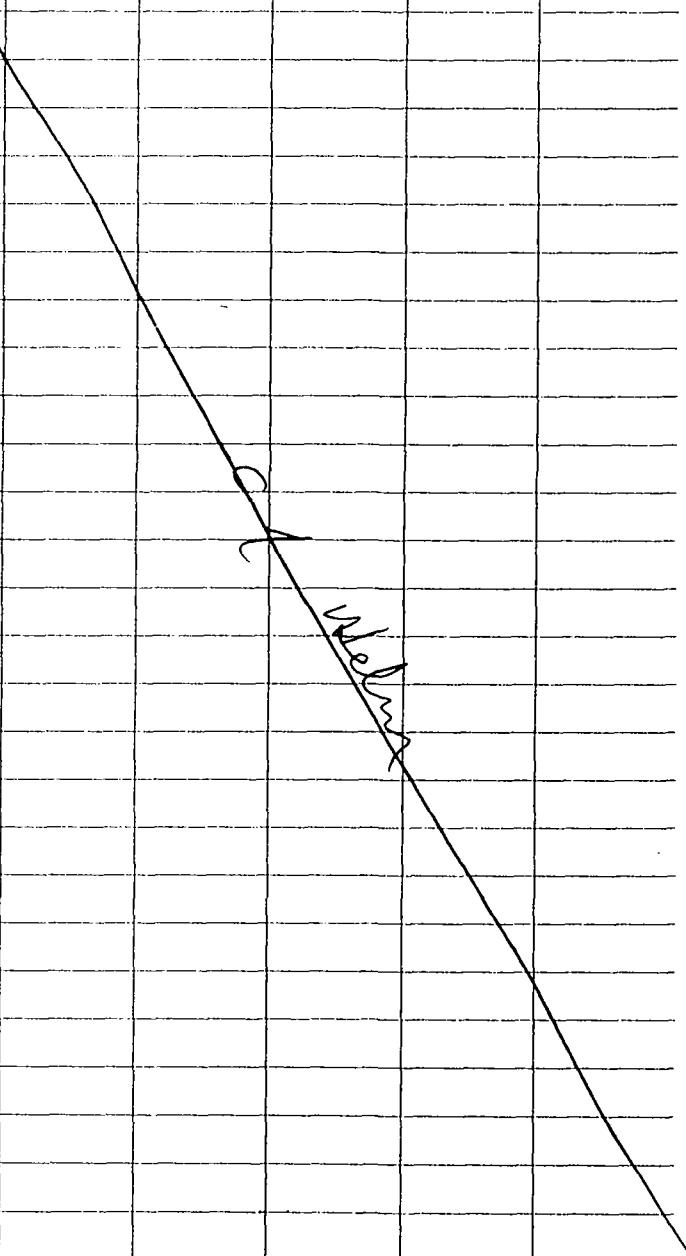
1440 Flushing out hole thru  
hole in down-hole rods (a hole  
above 20' of core barrel)

GC Lab has just informed  
Jeff that the 99' b/s  
water sample collected last  
night revealed 1,2 - PCA  
at 77 mg/l (no dilution curve  
factored out). Jeff wants  
to replace the recently set  
1" piezometer with a 1/2" Sinton  
steel well at 99' b/s - I said  
he needs EPA approval first.  
He will talk to Pete Vast first.

1600 Call Stone McKivicks to inform him  
of situation. Drivers continue to

16:50 Flush-out NW-31 borehole due to oil  
sheen on rods & down-hole water.

17:40 Depart site for Hotel



Wed. 2-14-96 ~~96~~ <sup>96</sup> 83  
24°, cloudy

- 0700 Depart Hotel for site.  
 0730 Arrive at ACS site.  
 0745 Drillers try to repair/troubleshoot the Roto-Sonic drill rig at NW-31 (NW-8) <sup>Locate</sup>  
 0830 Jeff and other Montgomery-hutton personnel discuss schedule and action plans.  
 10:00 Jeff informs me that:
- ① Another Roto-Sonic drill rig will be on site tomorrow or Friday to begin work on Monday 2/19/96.
  - ② Current on-site rig will be repaired today to operate tomorrow, to finish NW-31.
  - ③ PZ-44, 1" pvc piezometer installed yesterday = status unknown, ie, to keep on drill at & flush and use 2" stainless steel well instead.  
 (which I disagree with)  
 unless screen is below spot/poly levels.
  - ④ We are off this weekend. To start Mon. with a 10-day shift (1st one).

2-14-96

C 85

- 10:15 Call Sheri Bianchini at EPA, to inform her of schedule change and mw-31/P2-44 status.
- 10:40 Call Stone Markides to inform him of schedule change and drilling status of mw-31/P2-44 as well.
- 11:15 Dr. H rig is now operable after some parts were replaced.
- 11:30 Continue drilling/coring alternating with casing advancement
- 11:53 Borehole drilled to 75' 5 1/2".
- 12:20 Begin to set well, mw-31, 50' center of screen is at 69' 5 1/2". Stainless steel, 2" well with 10' screen instl 11/10/
- 13:00 Total well depth = 74.5' 5 1/2". Sand pack from 74.5' 5 1/2" to 62' 0" <sup>BL5</sup>. Fine sand also used, top of fine sand = 61' 0" 1/2" (1" thick).
- 3/8" bentonite chips placed from 56' to 61' 1/2"
- 14:20 Pure bentonite grout mixed, then tremied down to reinforce above bentonite chips / seal.

86

~~CH  
SPE~~

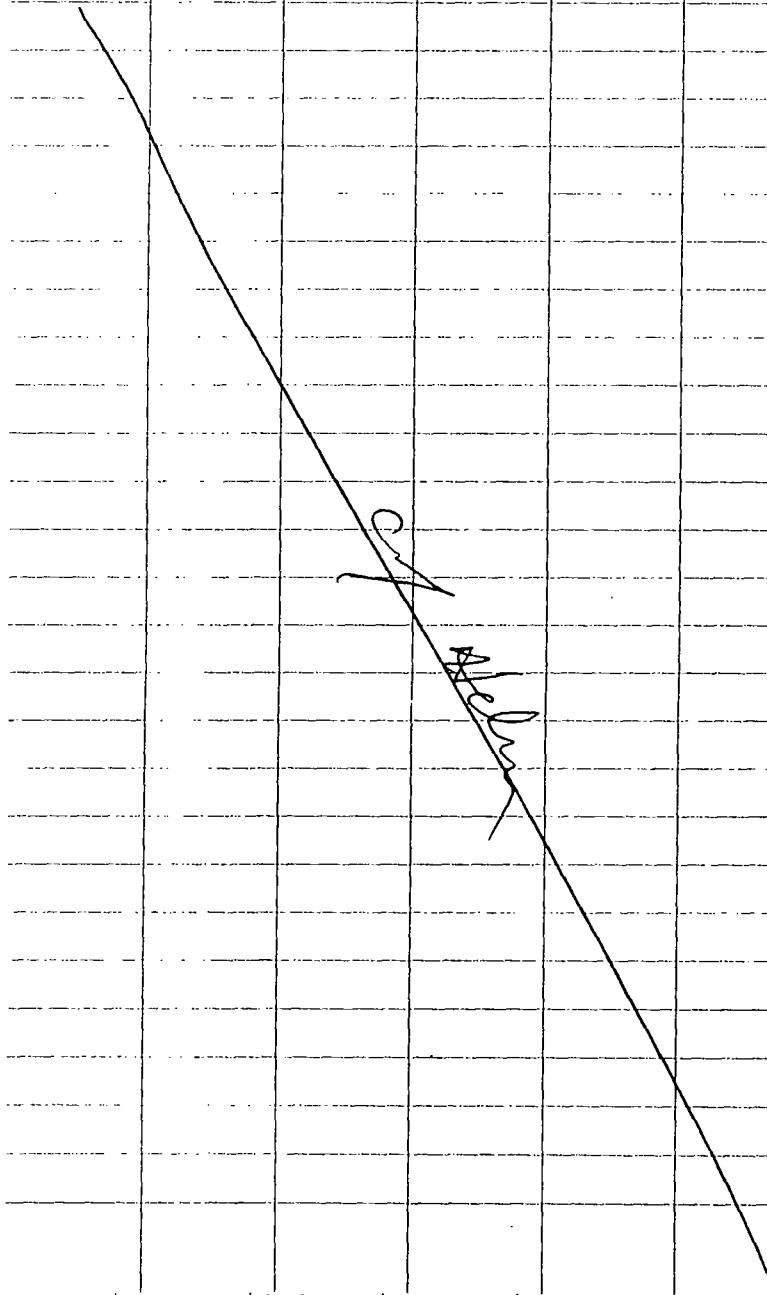
2-14-96

87

- 1540 Graft is weighed at 10.2 lb/sol. T requested used balance to be used to weigh, graft density.
- 1550 mu-31 is complete, graft trimmed in to top of graft to 1' 5".  
Clean work area, move drums
- 1645 Set up over PZ-44. Pete Vist has instructed Jeff and drillers to replace 1" PVC piezometer with a 2" stainless steel well. I can not stop work.
- 1700 Using at least 600 gallons of potable water, drillers flush out graft, sand pack, bentonite plus ~~in addition~~ CPB leaving the 1" PVC screen & riser in place (100' p.i.)
- 1815 Flushing off well materials is complete, and disposed/discharged north of borehole on the ground.
- 1830 Clean-up area
- 1845 Depart site.

~~C 1810~~

88



2-15-96 Thur  
clear, 17° F

89

- 0700 Report Hotel for ACS site
- 0730 Arrive on site
- 0750 At mw (PZ-44) borehole, ~12' PVC well (1") still in borehole, drillers drive 6" casing to 100' bgl. This will be mw - 32
- 0915 While driving casing, drillers remove PVC pieces with core barrel piece by piece. See photo.
- 1000 The pressure has snapped the PVC just above the screen.
- 10:20 Drillers retrieve the lower PVC screen piece & sump leaves/blowing ends.
- Drillers begin to flush out bottom of borehole & 6" casing.
- Montgomery Watson rationale for replacing piezometer is the following
- (1) A new well, at the very least, will also serve as a piezometer.
  - (2) Since both were verified at 2 intervals, both are now able to be sampled, thus them just one as was planned.
  - (3) New well screen will not be near the old PZ-44 grout or plug interval to avoid grout contamination at this mw.

2-15-96

91

1105 Stainless steel (2") well lowered  
into borehole - 10 foot screen  
Kale, non-driller, is helping out  
The crew at this location

1120-1215 Lunch break

1215 Set the sandpack with a stone  
pounder and continuous tape measuring.

1300 Top of sandpack is 89.0' 6 1/2

1315 Drillers add fine sand to 87.0' 6 1/2  
(2 feet total fine sand thickness)

1330 3/8" bentonite chips placed on  
top of fine sand to 82.0' 6 1/2  
(5 feet total plus thickness)

1350 Begin mixing pvc bentonite  
slurry for grout.

Begin tremie of grout  
from 82.0' to 72' 6 1/2

1430 Back at trailer for conference  
call meeting.

Major issues: All piezometers  
which were to be placed at base  
of lower aquifer will be 2" S.S. wells  
instead - EPA agrees - This will be  
the case for locations MW-9, 8, 10 & M4.  
Another Drill Rig onsite Mon, 2-11 run to  
finish job.

42

~~John~~  
~~Weller~~

2-15-96

93

- 1505 Jeff Ramsey now offsite  
(goes home) till Tuesday 7:00  
1540 Conference call concluded.  
1600 Roto sonic rig is moved  
to decom area, south of site  
trailer, to finish tub  
repairs. Then oil clean-up.  
1615 Call Steve McKicks, BV,  
to arrange schedule for 2  
drill rigs. He said Monica  
will oversee the non-vertical  
profiling rig and I will do  
vertical profiling. She will  
be onsite Monday at 13:00.  
1700 minor decom occurs for  
rods, core barrel, tools  
1750 Decom ends and will finish  
tomorrow.  
1800 Report site  
1830 Arrive at Hotel
- ~~John~~  
~~Weller~~

94

*C  
Recever*

2-16-96 Fri

2" snow, but clearing, 16°F

95

*Cyg*

- 0700 Depart Hotel
- 0730 Arrive at AEC site.
- 0800 Phil and Diane P download the True Hermit dataloggers (contains 7 days of water level data)
- 0830 Drillers Tim discards rig and crater track while Kale and Shawn install flush mounts (protective covers) at min - 28' locale
- 0930 Kale informs me that the 2nd rig which is to be used on Monday has broken down and hopefully will be onsite Wednesday of next week.
- 10:15 While using propane torch drillers burn PVC riser at PZ-418, 50'. They assure me that burned section will be cut to accommodate the flush top setting.
- 10:40 Call Steve Mrkwick to inform him of today's activities, and delay of 2nd rig.

96

2-16-96

97

- 11:15 Drillers dep. A site  
due to earlier flight  
for Tim Man expected  
Begin site clean-up - trash pickup  
12:00 Drillers will begin work  
on Monday 2/19/96 at 1300  
13:00 C. Holm departs site  
C. Holm arrives at hotel

98

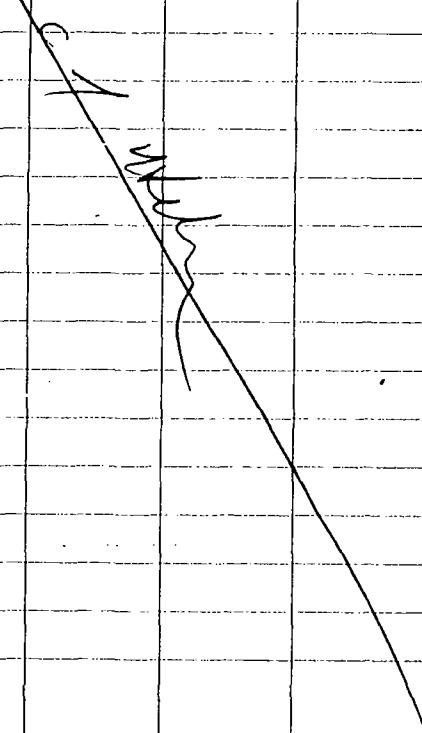
2-19-76

mon

99

- 11:00 Report Hotel  
11:30 Arrive at ACS site  
1200 Drillers Jim & Kyle  
on site.  
1225 Phil, Mont. Watson, asks  
Drillers to finish flush mounting  
at MU-28 location.  
1300 Call B.V.-Arizona office  
1400 Ordered flush mounting  
inst. 11 stations for MU-28,  
~~1404 PZ-47, PZ-48.~~  
1410 Mont. Points, Black & Venter,  
on stop, she will oversee  
the 2nd Rotacoring drilling  
which should start tomorrow  
+ Gusher g. site tank  
and discusses drilling issues.  
1545 Mont. leaves site & will  
start tomorrow ~ 8:00.  
Drillers Jim & Kyle set up  
at MU-10 location.  
MU-33 will be the 1st borehole  
here - at the bottom  
of the aquifer.  
1800 Depart site  
1830 Arrive at Hotel.

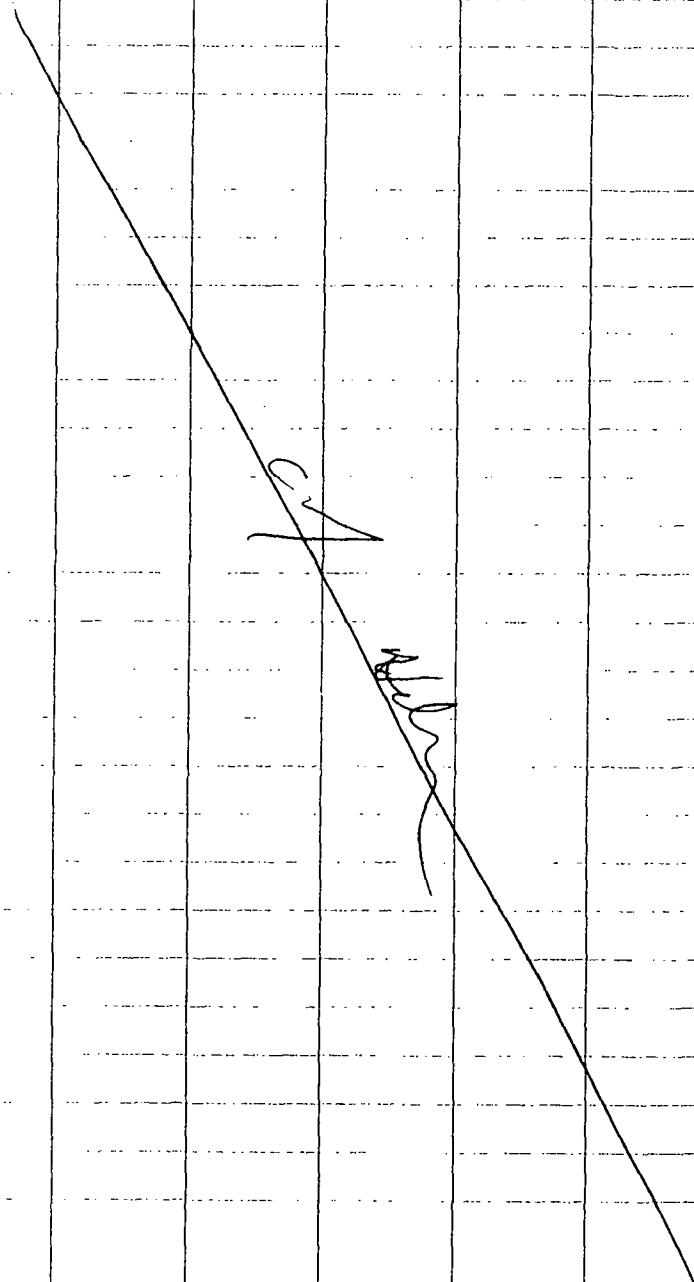
100



2-20-96 TUE. Sept 101

- 0700 Report Hotel  
0730 Arrive at ACS site  
0800 Set-up over mw-3B, check  
top of upper clay ~14' 6 1/2'  
9:00 Casing set at 14.0' 6 1/2'  
at the mw-10 location  
Drillers Jim & Kyle core  
14-25' interval, Phil Smith  
is Montgomery-Watson geologist.  
The clay confining layer  
ends ~18' 3 1/2" a 1-foot  
thickness only according to core.  
0910 Purge begins at the 29' 6 1/2'  
interval. Screened interval  
is 25' to 29' 6 1/2". Obar 15  
noticed, so Jeff collects a  
P.D. head-space sample, which  
reveals 20 ppm. Very  
slow purge at 29' 6 1/2"  
1005 Purge ends at 340 NTC turbidity  
1015 29' interval collected after 6 sets  
of parameters collected which reveal  
final readings of 340 NTC turbidity  
8.05 ft, 1740 ohm-cm conductivity  
11.5°C temp. - all readings  
stabilized +/- 10°

102



2-20-96

103

- 1030 Drillers core to ~ 45' LLS  
Drillers drive casing to  
28' LLS, Since vertical profile  
samplers need to come from "just cored"  
interval, Two 10-foot core sections  
will be collected to "catch-up"  
to SOW procedure of sampling  
within a "just cored" interval.  
as described above. See  
Pages 3 & 4 of TAB B of SOW.  
It is agreed to this "catch-up"  
11:00 Sheri Brandon on site to  
discuss scheduling and overview  
rototasonic drilling and vertical  
profiling. She views alternating  
casing driving and coring  
11:40 Drive Casing to ~ 34' LLS  
11:50 Fill clean screens/paint with sand  
12:00 Lowering Rods & paint & Screens  
to 39' (35-37' screened interval)  
12:05 Use water level indicator to ensure  
Screens is exposed. It is 18' into column  
12:0 Start purge at 1 gal/min  
Sheri views purging technique  
12:30 Purge ends

104

2-20-96

105

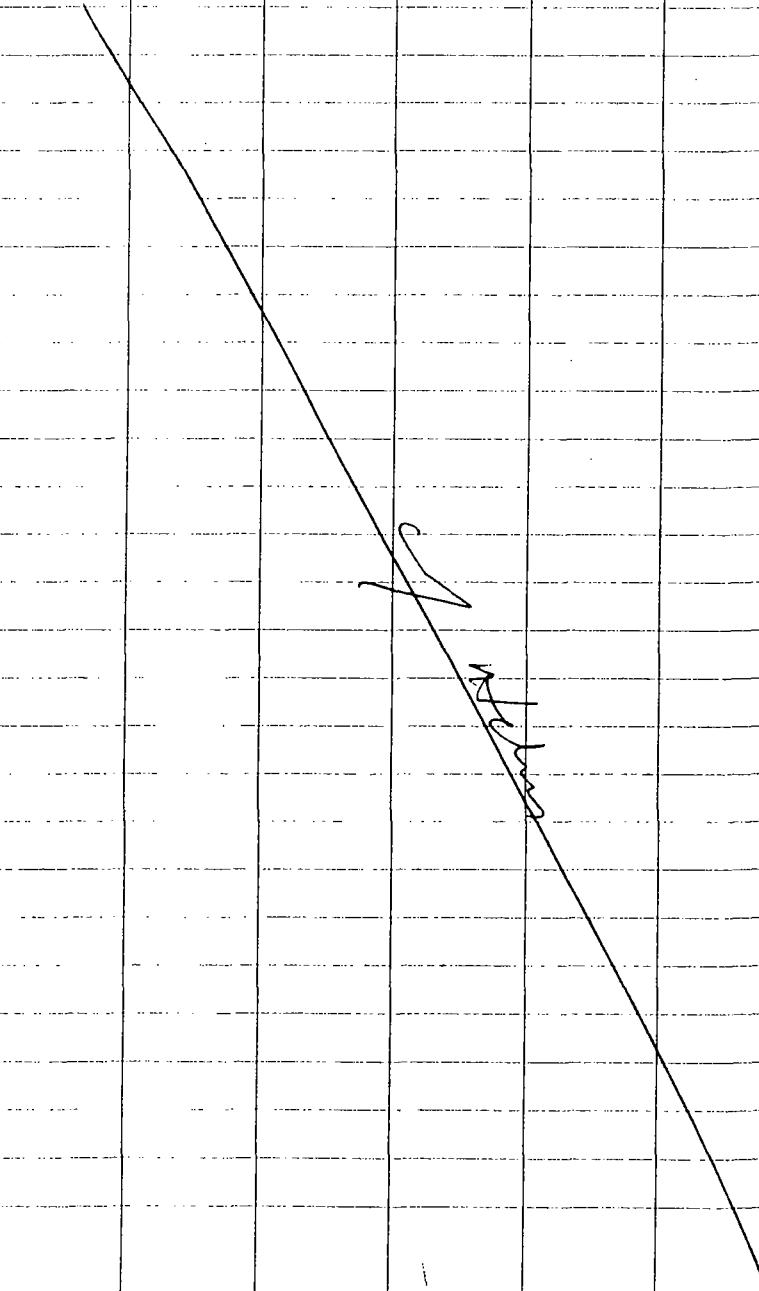
- Flow rate reduced to ~ 270 ml/min.  
Jeff samples the 39' b/s  
interval at 78 NTU turbidity.
- 12:40 Rob leaves on site to discuss  
issues with Sheri.
- 13:01 Sheri & Rob leave m/n-10  
location to view other wells.  
Drillers advance casing before the  
core (45-55') is extracted.
- 13:22 Core extracted and examined.  
Min screen set at 52' b/s for  
a screened interval of 418-52'  
b/s. A flow rate of ~  $\frac{1}{2}$  to  
3/4 gal per minute was established.
- 13:50 Problems in flow rate and/or pump.
- 14:05 Purge begins again.
- These final parameters are noted:  
28 NTU, 8.30 pH, 28.5 cnd, 12.0°C
- 14:22 Collected 52' under sampler at  
a reduced flow of approximately  
320 ml/min. A low  
turbidity sample - No odor.
- 15:00 Withdraw 55-65' b/s core  
No clay is observed in  
core sample. Lower vertical  
sampling screen & point.

2-20-96

107

- 1524 Purge starts for 5' 9" b/s interval. Staff uses  $\frac{1}{2}$  gal/min flow to purge. Water is clear, flow rate reduced  
1540 55 - 59' b/s sample collected. Final parameters are 59.6 NTU, turbidity 240 units/cm, Temp 11.0 °C, Tamp 8.36 pH, pHT  
1542 Drillers alternate between advancing 5" temporary casing and the 3" core barrel and associated rods  
1618 Withdraw 65 - 75' 50 core. No clay layer is noted in this sample, so drillers lower vertical profiling sampling equipment to 72' b/s.  
1640 Purge begins for 72' b/s (68 - 72' b/s screened interval)  
1658 Collected water sample from a stream flow  $\approx$  270 ml/min  
79 NTU turbidity, 1280 units conductivity  
11.1 °C, 8.92 pH Final parameters  
1740 Report site  
1800 Arrive Hotel

108



2 - 21 - 96 Wed.

rainy, 20°F, fog

109

- 0710 Depart Hotel for site
- 0735 Arrive at ACS site
- 0800 Vertical profiling continuing at new-10 location. Only Neutrone detects so far - 29' b/s
- 8:27 Daff collects 79' b/s water sample (75-79' b/s)  
1.8 NTU, 7.6 pH, 475 cond.  
7.0°C temp. are final  
parameters after 9 sets.
- 9:30 Drillers extract 85 to 95' b/s core from bivalve, top of clay is at 85' b/s, Montmorillon bivalve will collect one more water sample from 86' b/s (screened interval 86-82' b/s)  
Ground gas pump set at 80.5' b/s  
A total of 16 PID samples have been collected from the cores so far will be "sniffed" Thurs. or Fri.
- 1002 Purge begins at ~1/2 gal/min  
Purge water clearing up → 70 NTU's  
8.95 pH, 220 mbar cond, 8.0°C
- 10:17 Reduce flow to ~240 ml/min
- 10:18 Collect 86' b/s final water sample

710

2-21-96

CH/11

- 10:20 Kathy Grindstaff  
 Holly Greijda IDEM Reps  
 on site at mu-10 locate.  
 " 50' flushed at trench to 86.0' b/s  
 Bedrock sample needed so  
 11:10 95-105' core sample collected  
 IDEM status that:  
 All ID'd needs to be pulled  
 & in fenced area before end of  
 job - IDEM to in screen.  
 All drums need to be labelled also  
 11:40 100-105' ls core extended,  
 91D soil sample # 17 collected  
 11:50 Well materials: 10' stainless (screen)  
 steel, 10' lot screen, ss riser  
 set at 86.0' b/s. Sand to ~74' b/s  
 fine sand to 72' b/s, bent plug to 67' b/s.  
 13:25 Drillers begin mixing grout following  
 recipe in soil, very thick to pump  
 14:25 Pure bentonite slurry (grout) has  
 been tremied above bentonite seal  
 to ~20' b/s, will be unfilled later.  
 Drillers reposition over second  
 borehole at the mu-10 locate  
 (which will be mu-30)

112

2-21-96

2-21-96

1455 Call Steve McRaeckin,  
B&V Chicago. Oppen but he  
is not available.

1505 AT ASC side trucker, Mike  
(head driller) informs me that  
the 2nd Rotasonic rig should  
arrive Thursday night, decom  
on Friday AM, then begin  
operations early on Friday.  
Back at 11:10, water  
truck departs site to obtain  
more water before drilling  
resumes.

1540 Call Mona Reints, BV  
to inform her of most recent  
drilling schedule.

1550 Begin coring/drilling 2nd borehole  
at 11:10.

1615 Try to call Steve McRaeckin, BV  
but he is busy - leave message  
with Mona.

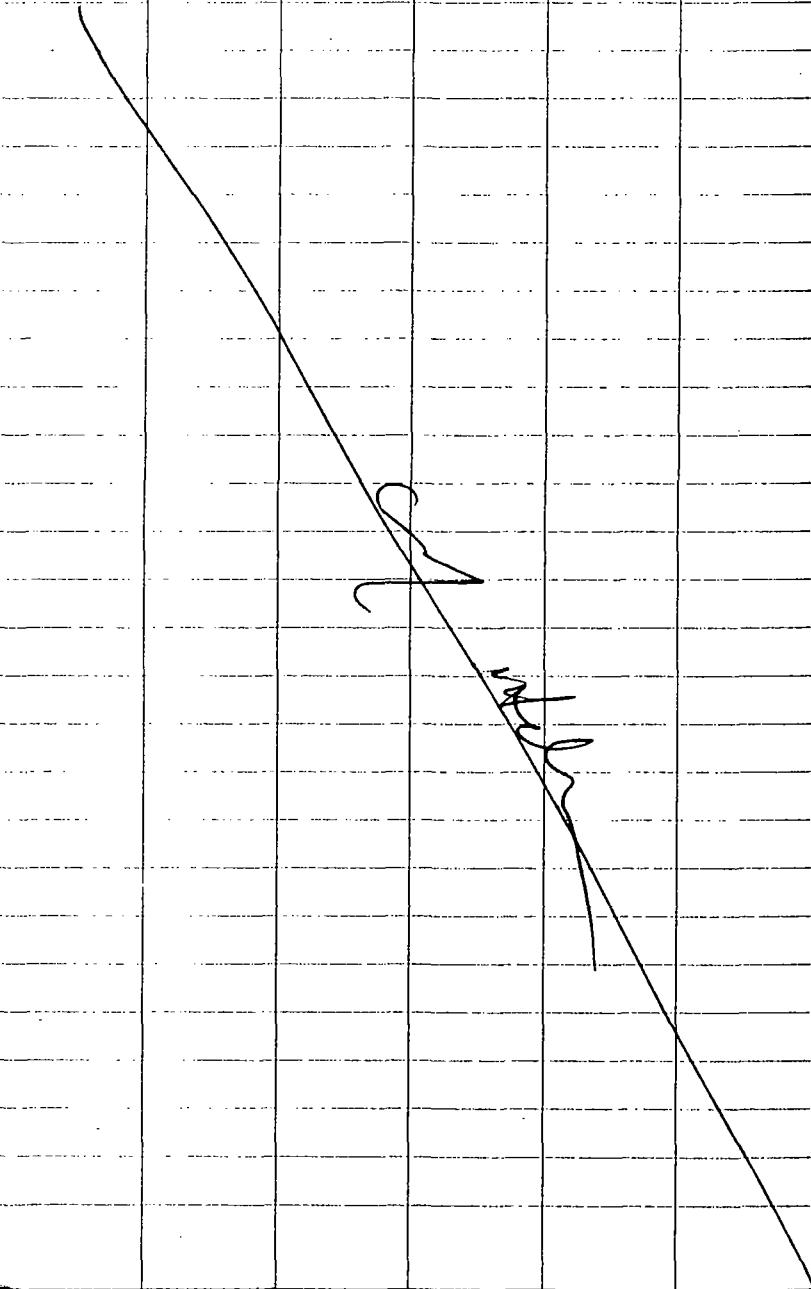
1710 Core/dr. 2nd borehole (mud-30)  
to 57' 51s. - mid point of Lower  
Aquifer - Not 555' elevation!!

1740 Report site

1810 Arrive hotel

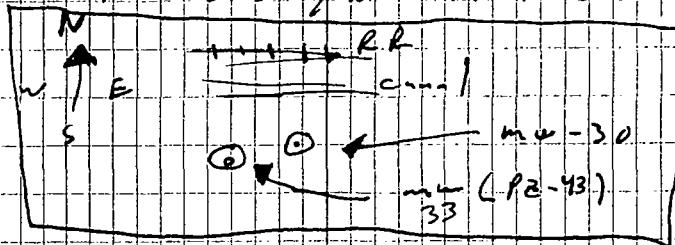
Catch

914



2 - 22 - 96 Thur

115

- 0720 Report Hotel for site  
0755 On site, Dr. Hees will finish MW-30, seated at 57' bds, 10 foot screen
- 0820 Assemble stainless steel well 10 foot screen, 10 slot, plus riser. Screened interval will be 77 to 81 ft (47' to 57' bds)
- 
- 0850 Sand pack placed from 57.5' bds to 45' bds (2' above screen)  
One foot of sand-free to 44' bds  
940 5 feet of bentonite plug (3/8" chips) to 39' bds.  
0950 Pure bentonite slurry (grout) mixed to as thick as rig pump can handle ~ 11 ft. c/f 16/44  
1020 Grout to land surface, then add over grout to water level at (P2-43)- mw 33  
10:45 Drillers begin to demobilize to decom area near timeline

116

2-22-96

off  
117

Call Maria Rechts, BL to inform her that 2nd Rig will be here on site tomorrow AM. Steve Mirkovich has just left office for Aes site.

1105 On New begin decom procedures on drill rig & support truck.

1145 Meet with Steve Mirkovich, Black & Veatch Project Manager. We discuss issues such as scheduling 2nd Rig on site, Oversight Report Guidelines and due-dates, Photographic Log information.

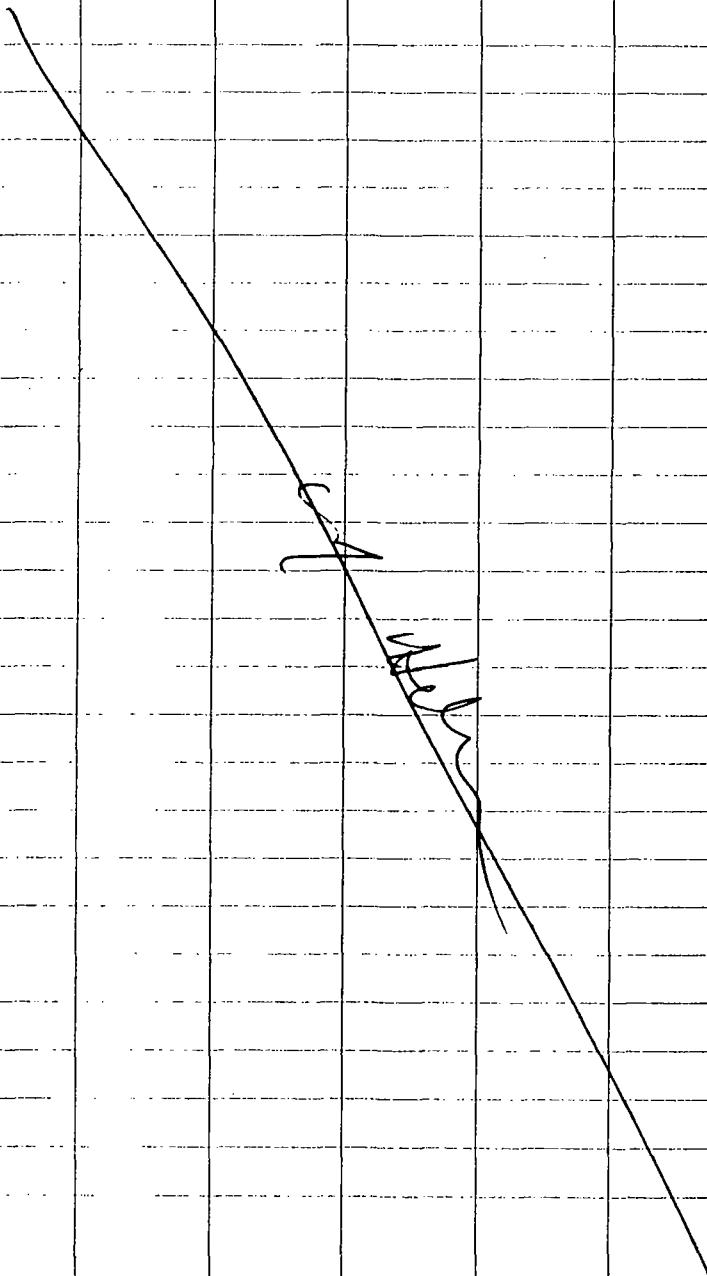
1215 Steve Mirkovich departs site.

1240 Back at MW 10 locale. Jeff Ramsey is helping spread or remove gravel with a Bob-Cat machine. He hits the completed MW 33 stick-up and bends it. It

13:00 is fixed by replacing upper 10 ft of stainless steel casing. But upon impact, grout may have seeped into the lower pipe - suspect

14:30 - 16:20 Teleconference call  
See 1700 & telecon.

118



2-22-96

119

Note: Rig now at mu-9 location

1640 Drillers begin purge at  
the 35'-39' screened interval  
at ~ 1/2 gal/min.

Note: New driller's helper on site,  
Shawn Pebble, Also, during  
purge an Encore a water  
sample was collected from  
30 to 26' b/s, Permanent  
casings seated at 17' b/s, clay  
extended to 25' b/s.

1705 Purge ~~comes~~ flux reduced before  
32' b/s sample collected

1800 NTU's turbidity, 285 mhos  
conductivity, 8.1 pH, 11.0°C

1715 we core 45' - 55' b/s sample  
this 1st borehole at  
mu-9 location will be  
drilled to the lower clay  
to set mu-34

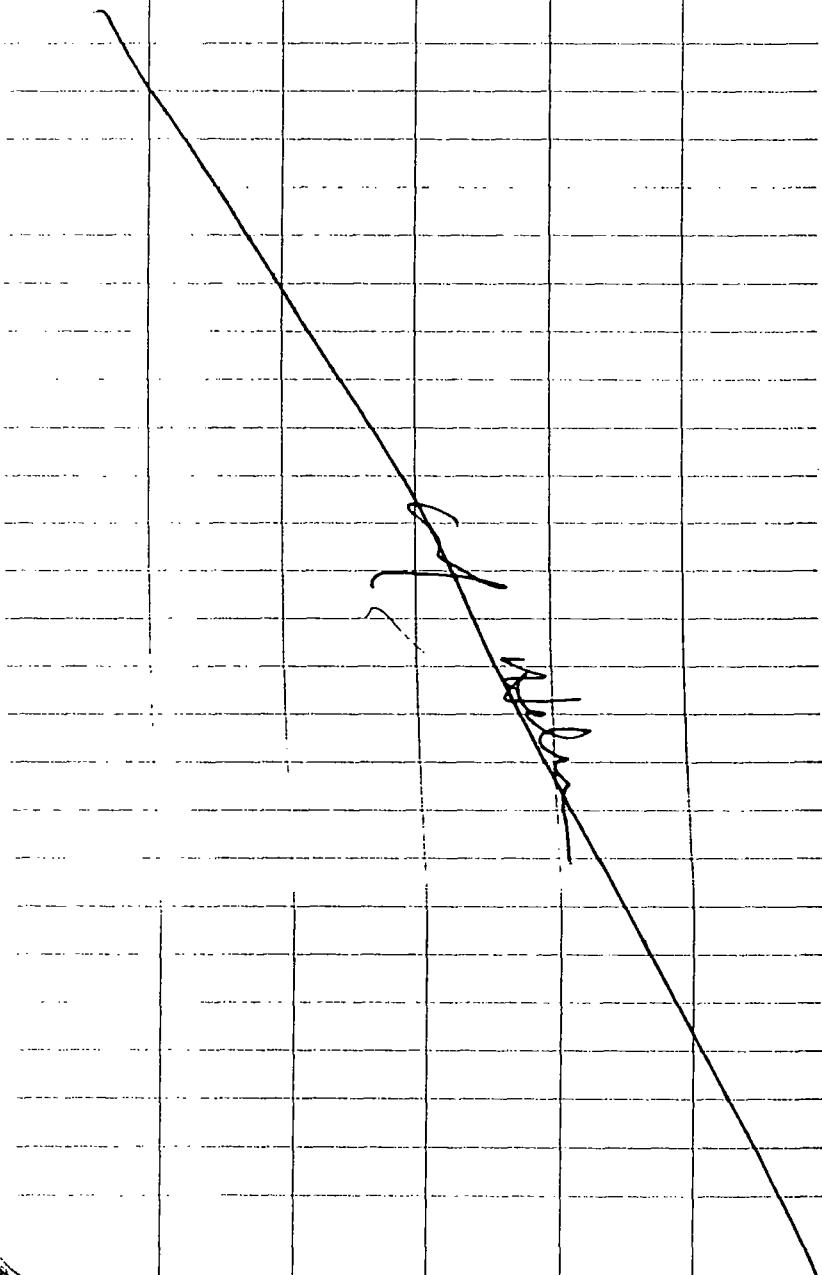
1740 Drive casing to 45' b/s

1800 Set up for a water  
sample which will be  
collected tomorrow.

1815 Report site.

1850 Arrive at Hotel.

120

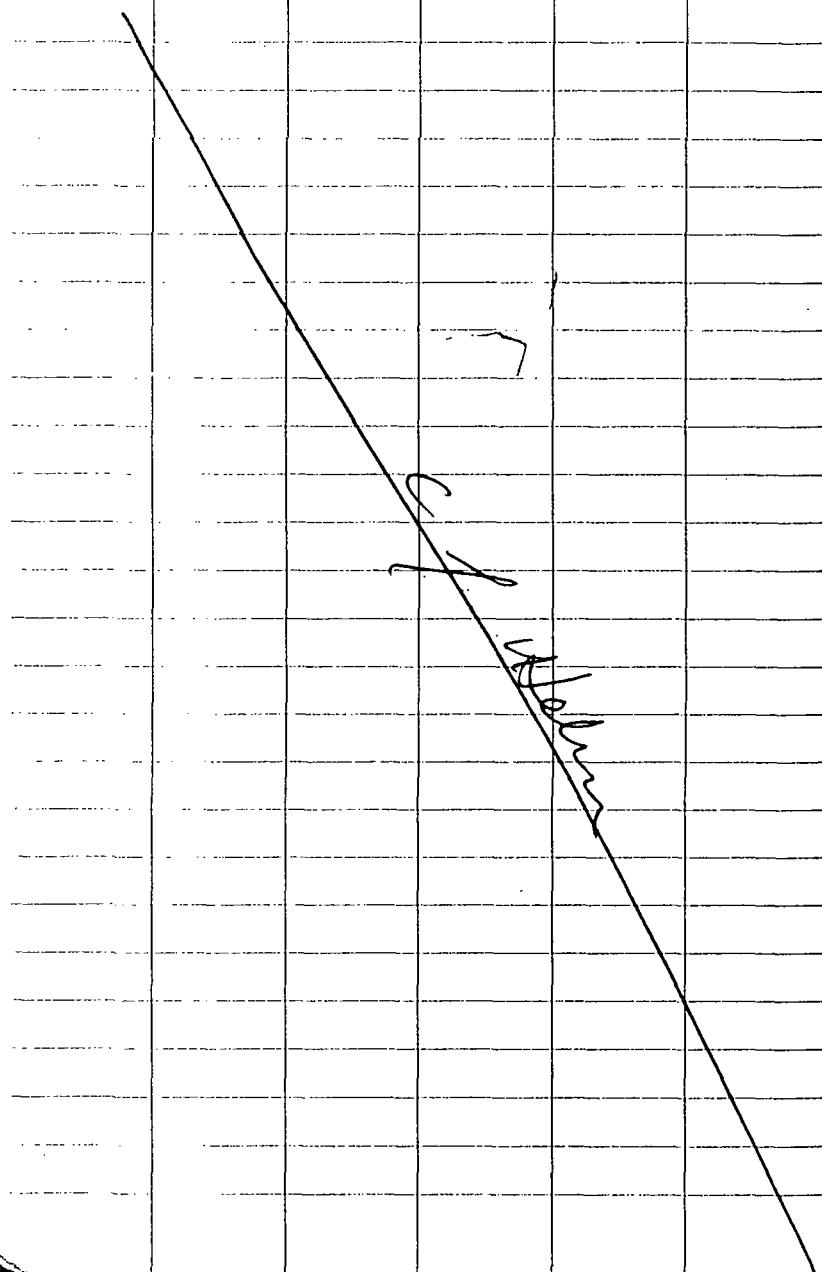


2-23-96 Fri.

Off  
120

- 0720 Report Hotel  
0750 Arrive at Acc site  
0815 New drill rig on site,  
mow. Points on site also  
AT mow-9, Dave Piciunski  
collects the 49' b/s sample  
(censored interval 45-49' b/s)  
Call in timesheet - BL office  
Help out Dave, since he is  
taking Jeff's place, while Jeff  
is with The 2nd Rig at M4 locale.  
gives Holly and Cathy, IDEM,  
on site to videotape mow-9, M4 work  
0915 Take Holly over to my  
Locale where mow is  
conducting EPA oversight.  
Bottom of upper clay at M4 is 45' b/s  
10:20 Back at mow 34, I notice Dave  
placing No foil over his core samples  
to be PID-read later, I compromised  
with him to use plastic sheeting  
instead of foil to trap organic vapors.  
11:40 75 to 85' core extracted.  
Walk to 8-63, Photography shown  
on standing water for EPA analysis.

122

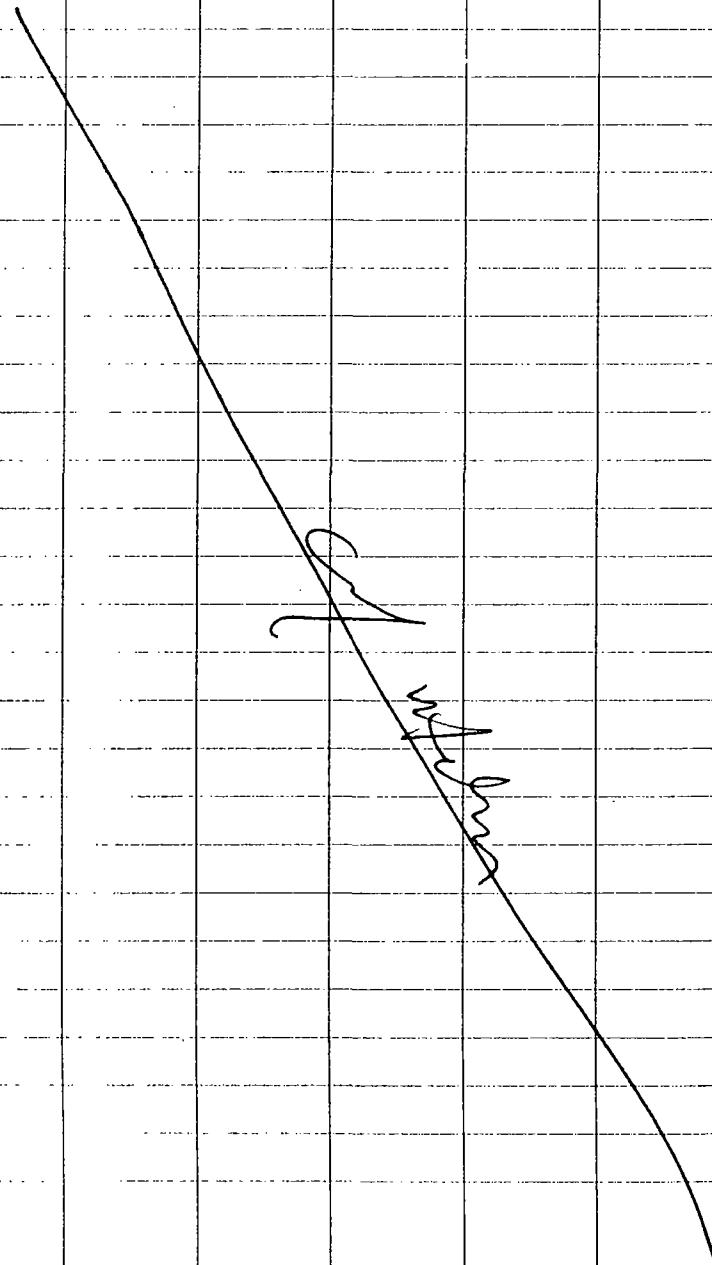


2-23-96

123

- 12:10 79-75' b/s interval sampled. Stable parameters revealed 9.0 NTU's, 2.90 ohm $\cdot$ m, 10.2°C, and 8.65 pH values
- 1238 Talk to Sheri Bischig, EPA, she will be on site today between 3:00 - 5:00 to hand over video cameras for mons & I to use on Roto Sonic Drilling and vertical profiling. She wants an introduction and narrative for video to be done Sat. 2/24.
- 1410 Extraction of 85 to 95' b/s are Top of clay revealed at 92.5' b.s.
- 1440 Purge begins for 88-92' b/s with sample, final parameters: 11 NTU Turbidity, 8.30 pH, 360 ohm $\cdot$ m conductivity, 11.0°C temp
- 1455 92' sample collected - low flow
- 1535 Stainless steel well inserted constructed & placed down borehole bottom of well = 93.0' b/s top of screen = 83.2' b/s This will be mn-w-34.

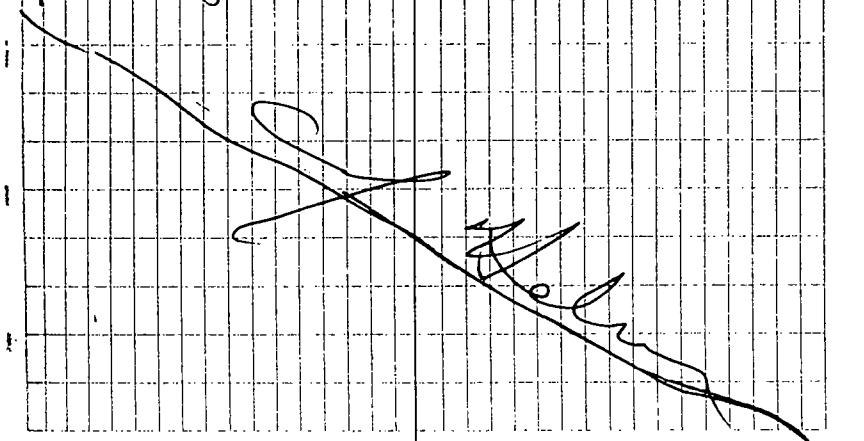
124



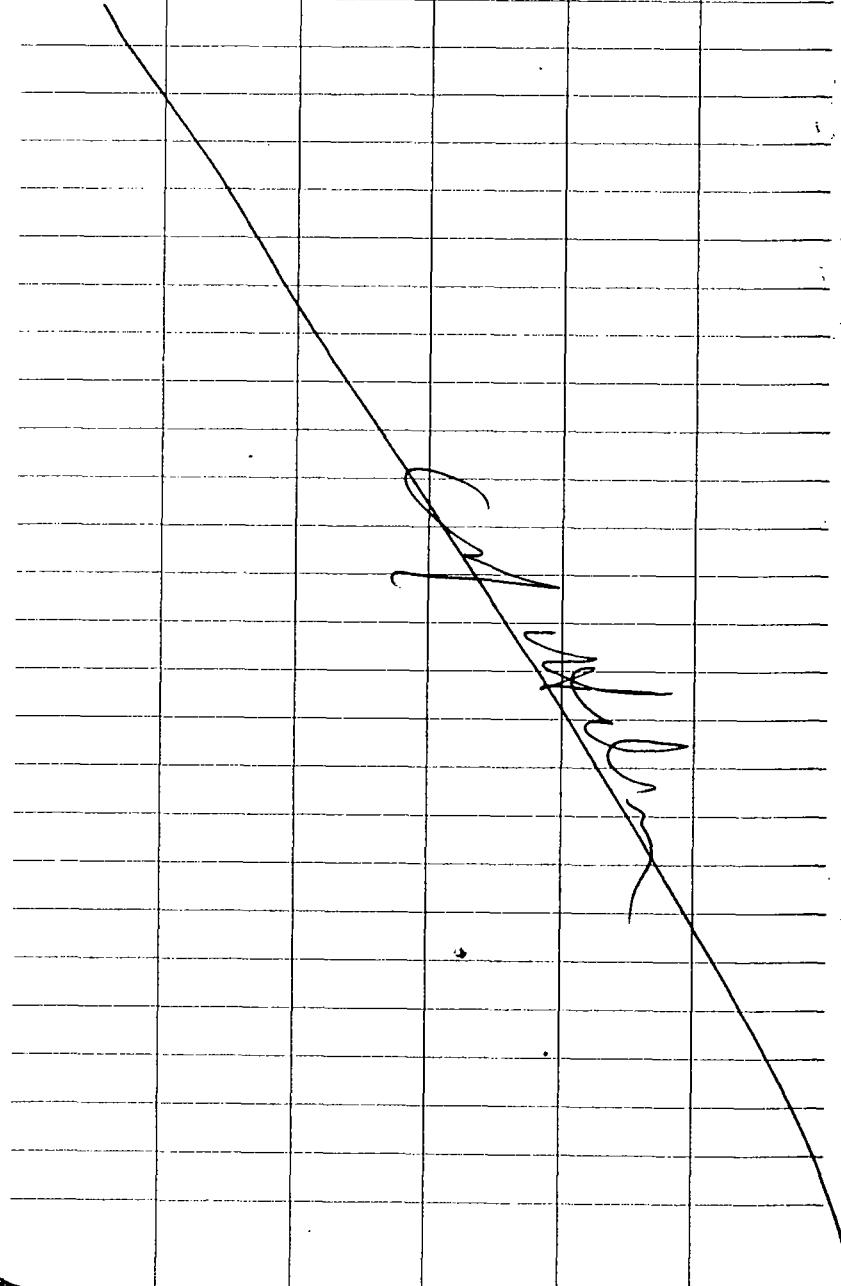
2-23-96

Jeff  
125

- 1600 Sand pack poured to  
81.0' b/s, fine sand packed  
1620 to 78.0' b/s. Then pure  
Bentonite chips ( $\frac{3}{8}$ "") poured  
slowly to 74.0' b/s  
1635 Pure Bentonite slurry great  
mixing begins. Grout density  
appears to be extremely  
thick and appropriate  
based upon son guidelines.  
1740 After 4" batch of "tubs"  
of grout, Top - of - ground  
reaches land surface  
for min - 34  
1800 Report side for hotel  
1830 Arrive at Hotel



126



2-24-76

Sat.

127

0700 Report Hotel

0730 Arrived site - ACS, Inc.

Shari Planckin had dropped off a camera (video) to tape rotorsonic drilling and vertical profiling today

0750 Drillers set up at 2nd borehole at MW - 9 (mw-29)

0755 Begin to drive casing and core (drill). No more vertical sampling at ACS after M4.

8:45 Mona Reints and I begin to videotape site features with introduction and background narrative  
Mw to M4 to video vert. profiling

Back at MW - 9 borehole (mw-29),

9:10 Drillers core/drill to 80.0' b/s, so

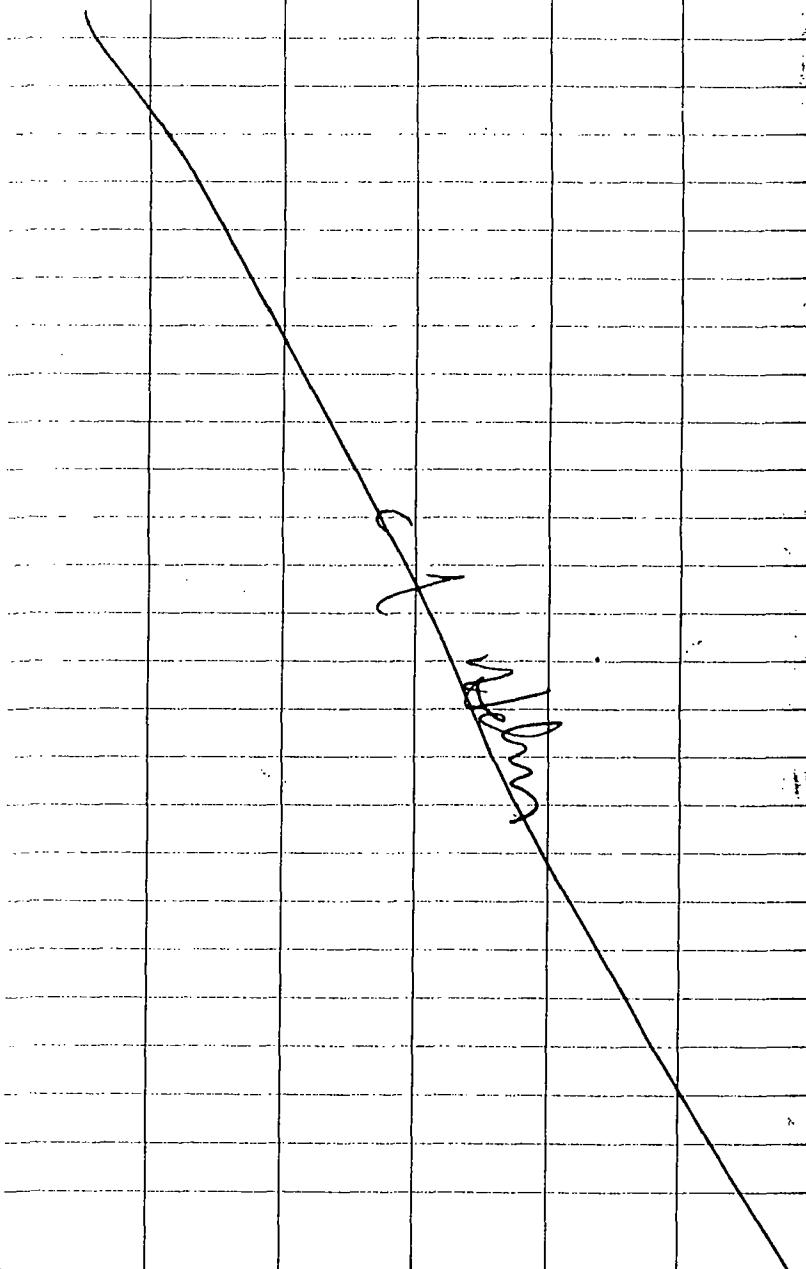
59.8' to 49.8' b/s is screened interval for 2nd borehole at MW - 9 (mw-29)

Screen pack (#7 sand) packed from 60' to 48.0' b/s, 1.8' above screen

9:35 Fine sand packed to 46.0' b/s

9:42 Bentonite hole plug (3/8" dia.) slowly packed to 41.0' b/s - measured at top

128

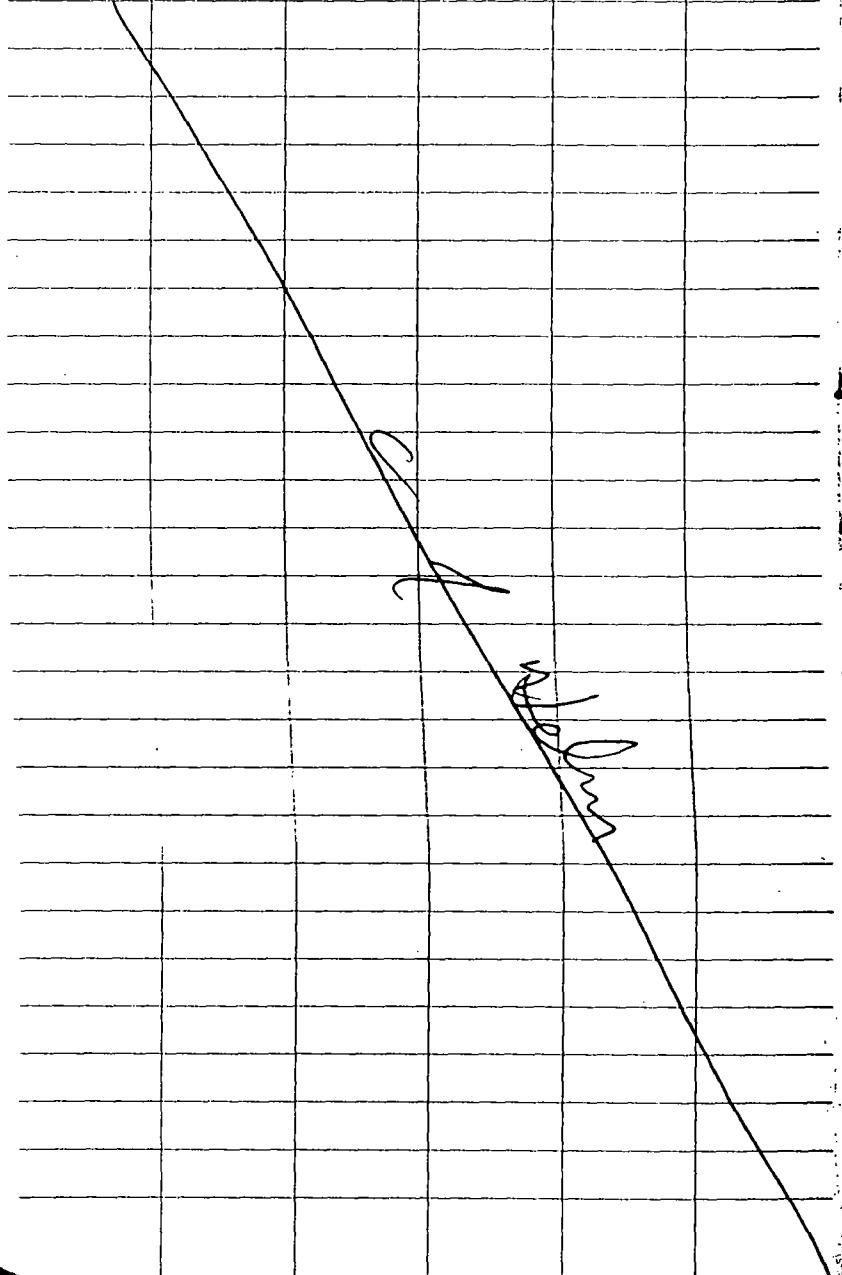


2-24-96

129

- 9:55 fine bentonite slurry mixed  
for grout per SO4.
- 10:20 Grout up to land surface  
Begin site clean-up
- 10:50 Move rig & support truck to  
Recon area, begin decom procedures
- 11:20 Help videotape M4 core  
drilling & vertical profiling  
procedures with Mora
- 11:30 Rig is decomposed and  
begin to set-up on mu-7  
(Helen) covers site to repair  
window in EPA van 740
- 12:10 15 to 25' core collected
- 13:10 25' to 45' core collected
- 13:45 Frith Schilling departs site  
after visiting the mu-7 locale.
- 14:30 55'-75' b/s core collected  
at 1st borehole at mu-7 locale.
- 15:45 75-95' b/s core extracted  
Top of clay = 91.5' b/s here at mu-36
- 16:00 D-110 is moved site to fill up  
water tank, + notice that  
no stainless steel well majoring  
on support truck, and I inquire.

130



2-24-76

131

Karl had told Dave, the on-site geologist, to place a picrometer at bottom of lower aquifer at mn-7 locale - 5' of sand need. I think a well should be placed here, I'll call Sheri, EPHR, 1630 Call Sheri to discuss (1) picro vs. well at mn-7 locale (2) At mn-4 locale, driller broke threaded end of temporary casing bottom of This 5" casing is in bentonite seal. This casing is to be left in to act as a double-cased well. She wants to speak to Dave Piciaski.

Go to mn-7 locale to stop work  
Go to on-line to get Dave to call  
Sheri back at home.

1640 Call Sheri back - Dave & Jeff will check with Pete before installation which will occur tomorrow.  
Also a double cased well for mn-35 (at mn-4) is OK as long it is not in sandpack.

1750 Depart site  
1830 Arrive at Hotel

CJ Helm

92 SAT 2/24/96

RJ

STILL 1300 RONALD RAMSBY MEET LUNCH.  
1345 AT MY LOCATION THE WELL IS  
ABOUT TO BE INSTALLED. THE  
BOTTOM OF THE WELL WILL BE AT  
89'.

1355 A 10 FOOT STAINLESS STEEL  
SCREEN IS PUT IN THE HOLE,  
STAINLESS STEEL RISER FOLLOWS.  
THE SCREEN & RISER ARE SEALED  
IN PLASTIC PRIOR TO INSTALLATION.  
1420 REINTS IS AT PZ 45 LOCATION  
WITH HELM. REINTS DROPS OFF  
VIDEO CAMERA SO HE CAN FILM DRILLING  
AND WELL INSTALLATION.

1450 BACK AT MW9 LOCATION SAND  
IS BEING INSTALLED FOR THE SAND PACK  
1455 BY VIBRATES CASING SO SAND WILL  
SETTLE

1500 SAND IS INSTALLED TO 76'

1519 CASING IS VIBRATED AGAIN TO  
SETTLE 1.5 FEET OF FINE SAND

1540 BY SHUTS DOWN TO MEET WITH  
THE OTHER DRILL CREW AT PZ 45

WHILE RAISING 6" CASING (AFTER  
PLACING BENTONITE) THE

RJ

SAT 2/24/96

RJ

93

CASING BROKE OFF ABOUT 1 FOOT  
"above" CASING BOTTOM. ABOUT  
HALF OF THE BENTONITE SEAL HAD  
BEEN PLACED OUTSIDE THE CASING  
(HALF STILL INSIDE 6" CASING)

DRILLERS CONFER

1600, RAMSBY STATED THE ADDITIONAL  
CASING WOULD NOT NEGATIVELY AFFECT  
THE WELL'S INTEGRITY.

DRILLERS CALLED THEIR OFFICE  
1640 BACK AT MY LOCATION. DRILLERS  
HAVE GOTTEN AN OK TO COVE THE 6"  
CASING IN, SO WELL IS DOUBLE CASED  
TO THE SEAL

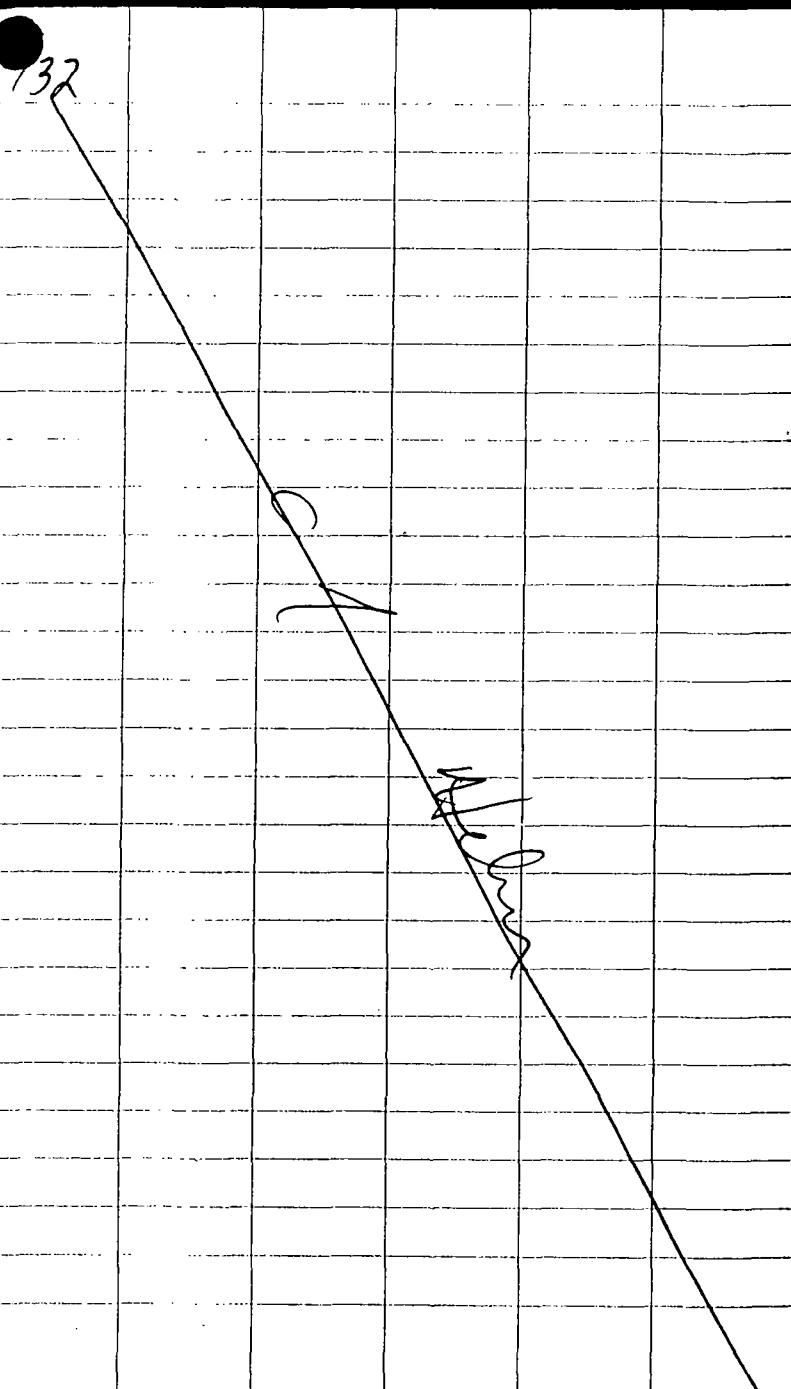
1645 GROUT BEING PLACED

1700 RH IS BEING CLEANED UP  
1716 HELM ARRIVES AND DISCUSSES  
HIS CONVERSATION WITH BIANCONI.  
PART OF THEIR TALK CONCERNED THIS  
WELL BEING DOUBLE CASED

1730 REINTS EXITS SITE

2/24/96 RJ

732



2 - 25 - 96 SUN

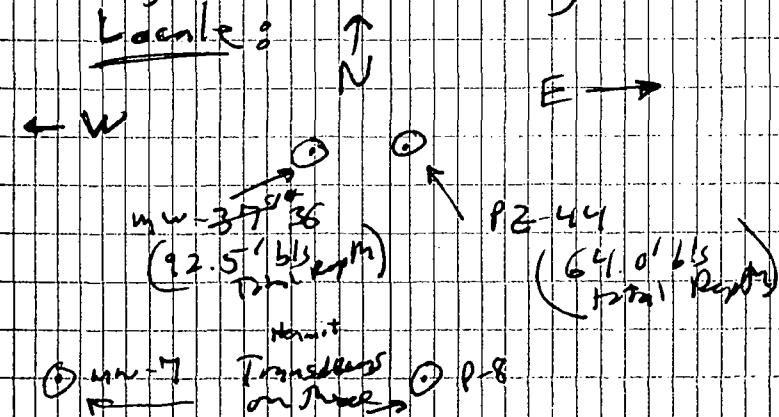
733

0700 Report Hotel

0720 Arrive at ACS site

0805 Drillers are completing  
MW-36 as I requested  
Screened 92.5 to 82.5' b/s, 2' sand  
above and 5' Gypsumite Plg. 6mt

0950 Begin PZ-44 drilling at MW-7

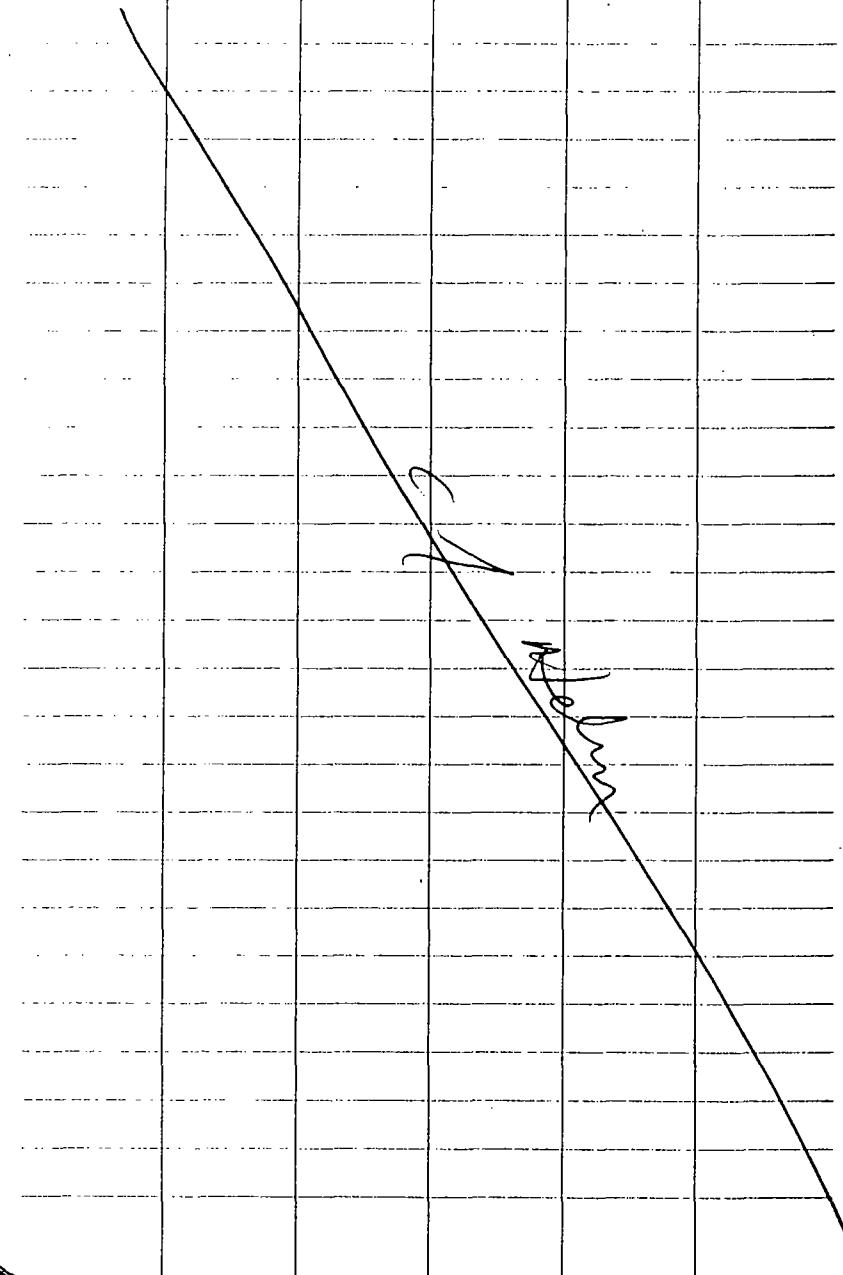


Note: Transducers need to be unloaded today.

1047 While drilling/coring/casing  
PZ-44, The 5" Casing  
broke apart at the threads  
at 26' b/s. Drillers pull all  
3" rods up out of hole and  
insert a "Taper Tap" to retrieve  
the casing.

12:05 Taper Tap works, we continue at 10L  
12:10 New casing. Walk site to photo p.tops.

134



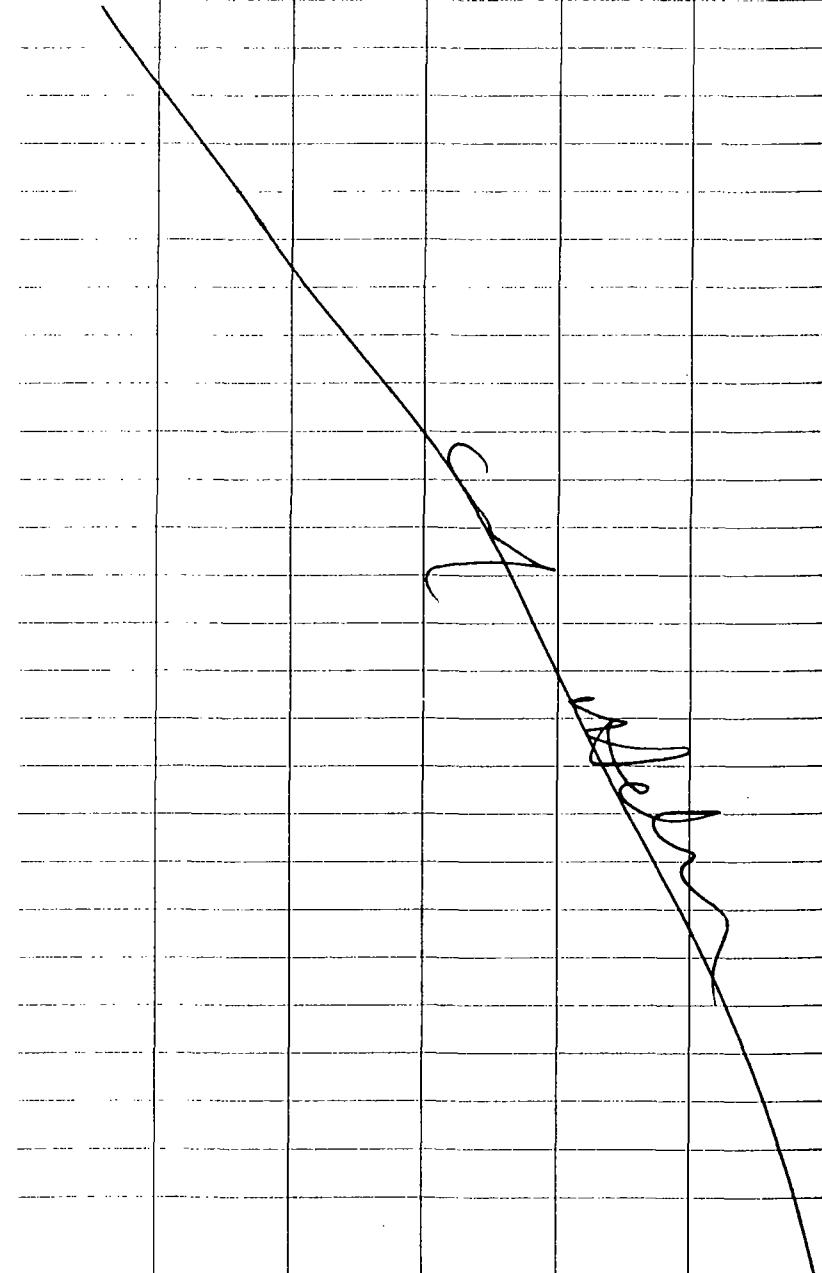
2-25-96

135

- 1345 Jeff measures casing tail screen lengths of PZ-44  
1 1/8" of 2" PVC sch. 40, 10 ft.  
total length 5' 3", 5' part/base  
AT min 7 locations.
- 1420 2" PVC screen & riser constructed  
and inserted into the 6 4 0' 6 1/2
- 1425 borehole, sand pack placement by 2
- 1435 While pulling 6" casing up during  
sand pack placement, the actual  
well came up 1 5/8" to prevent  
screen from breaking while still  
pushing down on riser. Jeff  
said to set PZ-44 at 6 2 5/8".  
Apparently no well damage  
was incurred.
- 1500 Begin working pure bentonite  
grout to finish up PZ-44  
and "top off" grout at min 3C
- 1540 To land surface.
- 1545 Phil Smith on site to  
download Hermit Park Loggers
- 16:20 I observe download
- 17:15 Depart ACS site
- 17:45 Arrive at hotel

CJ Wel

136

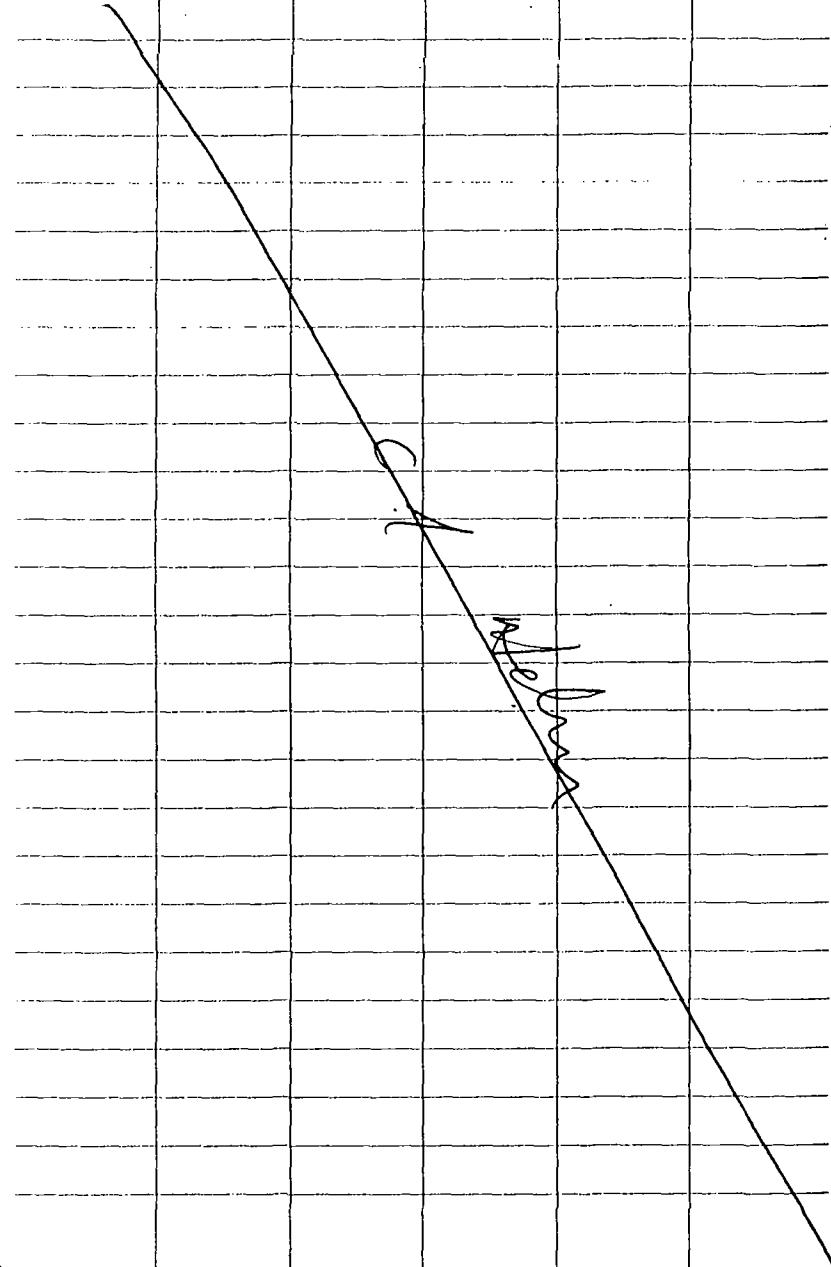


2-26-96 MON

137

- 0700 Report Hotel for ACS site  
0730 Arrive at site, Drillers  
are installing protective  
taps at PZ-44 and  
un-36 using procedures  
defined in SOW, TAB B, pp 8-10.  
0920 Called Sheri Bindus  
at EPA to give her a  
final update and inform  
her that I could not  
reach or communicate with  
The Gordons at 1009  
Reder Road for geopak  
access.  
10:00 Called Mons Raines  
and Steve Markwick  
to coordinate schedule  
of my trip home.  
10:40 Drillers decor equipment  
and tools, rig, etc.  
prior to leaving ACS  
site.  
11:30 Jeff and Dave Montgomery-  
Ketton collect soil size  
/grain size analysis samples

138

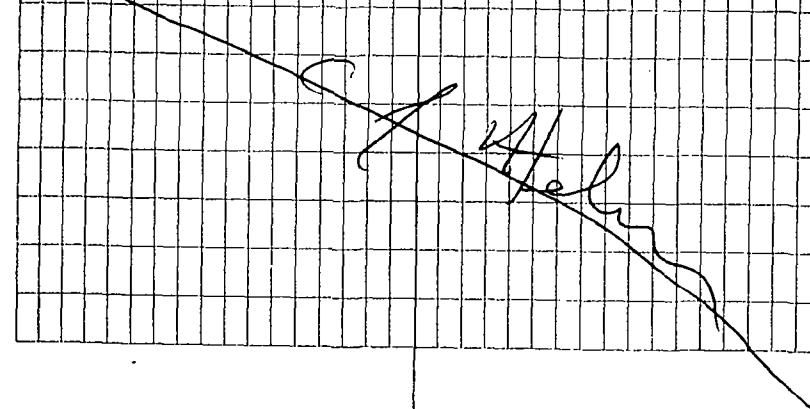


2-26-96

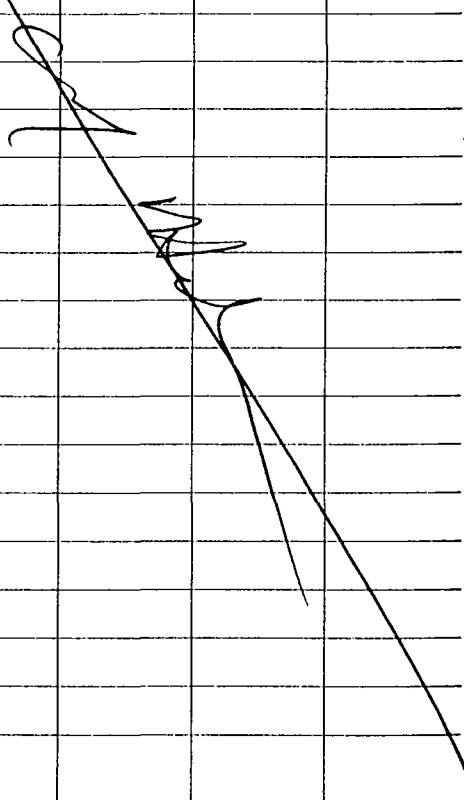
✓  
139

as directed by SAW for  
screened intervals (3 for  
each core.

- 12:00 Montgomery - Watson go  
finish photographing the  
cores and storing them  
in South corner of trailer  
12:50 Depart site to Hotel  
13:30 Arrive at Hotel, pick up  
check-out.  
14:00 Drive to EPA Vehicle -  
lock-up on Harlan &  
Avondale Streets  
Get Fuel fill-up,  
Get ride to airport  
15:30 Fly O'Hare → Atlanta 18:30  
19:30 Arrive home



140



MONTGOMERY WATSON

One Science Court (53711)  
P.O. Box 5385 (53705)  
Madison, Wisconsin

Telephone: 608 231 4747  
Fax: 608 231 4777

R. Jeff Ramsby  
*Hydrogeologist*

*Serving the World's Environmental Needs*



MONTGOMERY WATSON

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Keith E. Schilling  
*Senior Hydrogeologist*

*Serving the World's Environmental Needs*

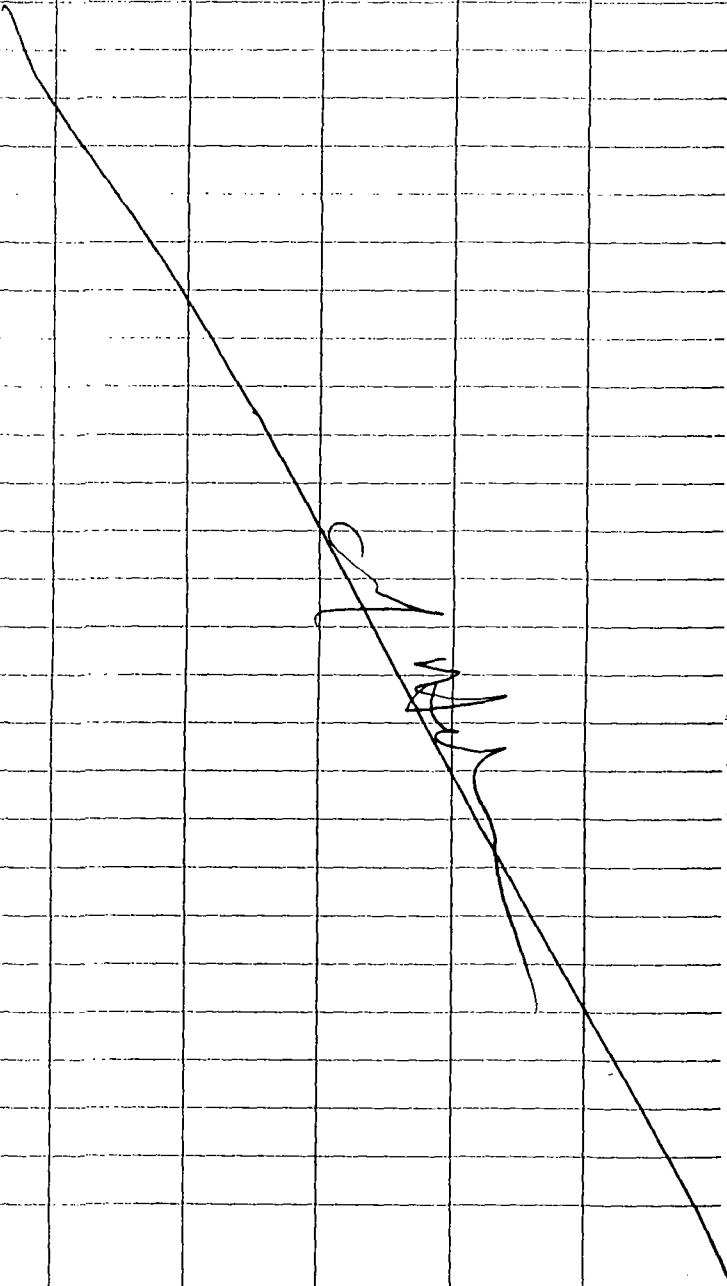
Kale Bittner



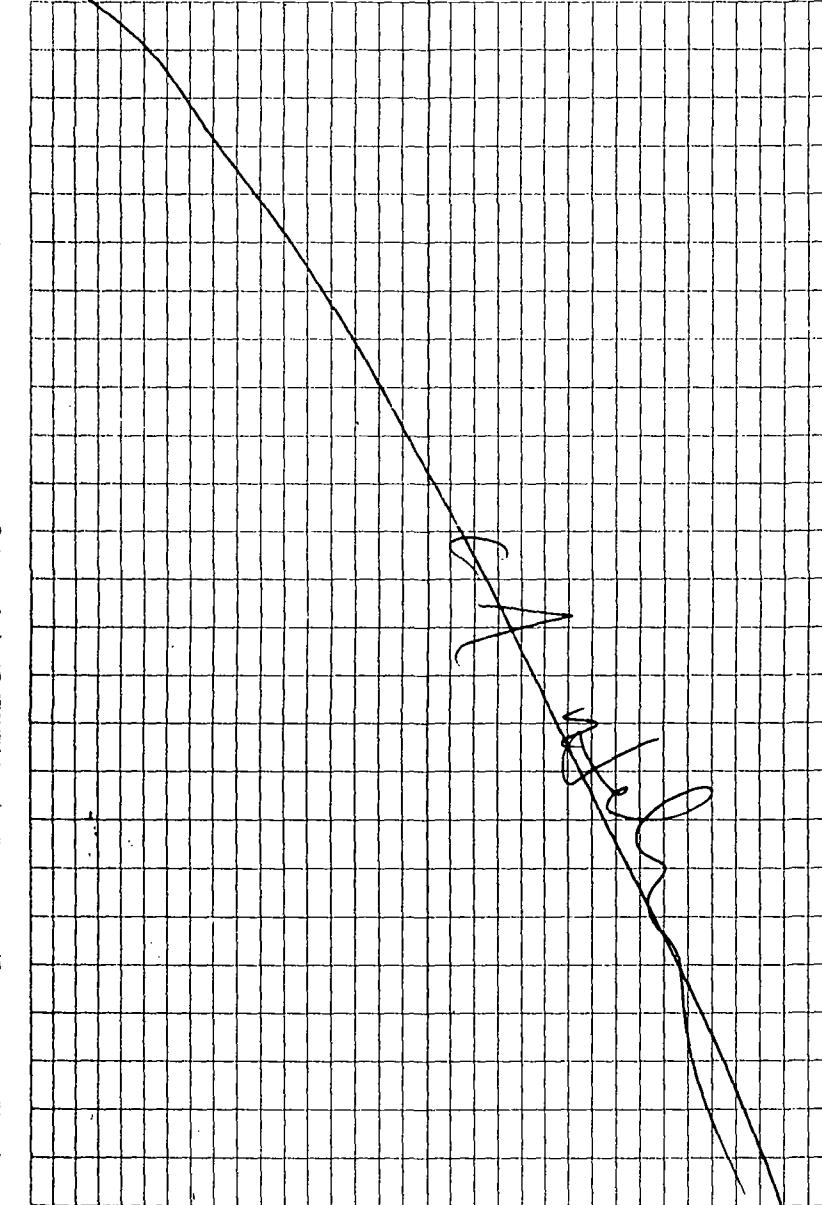
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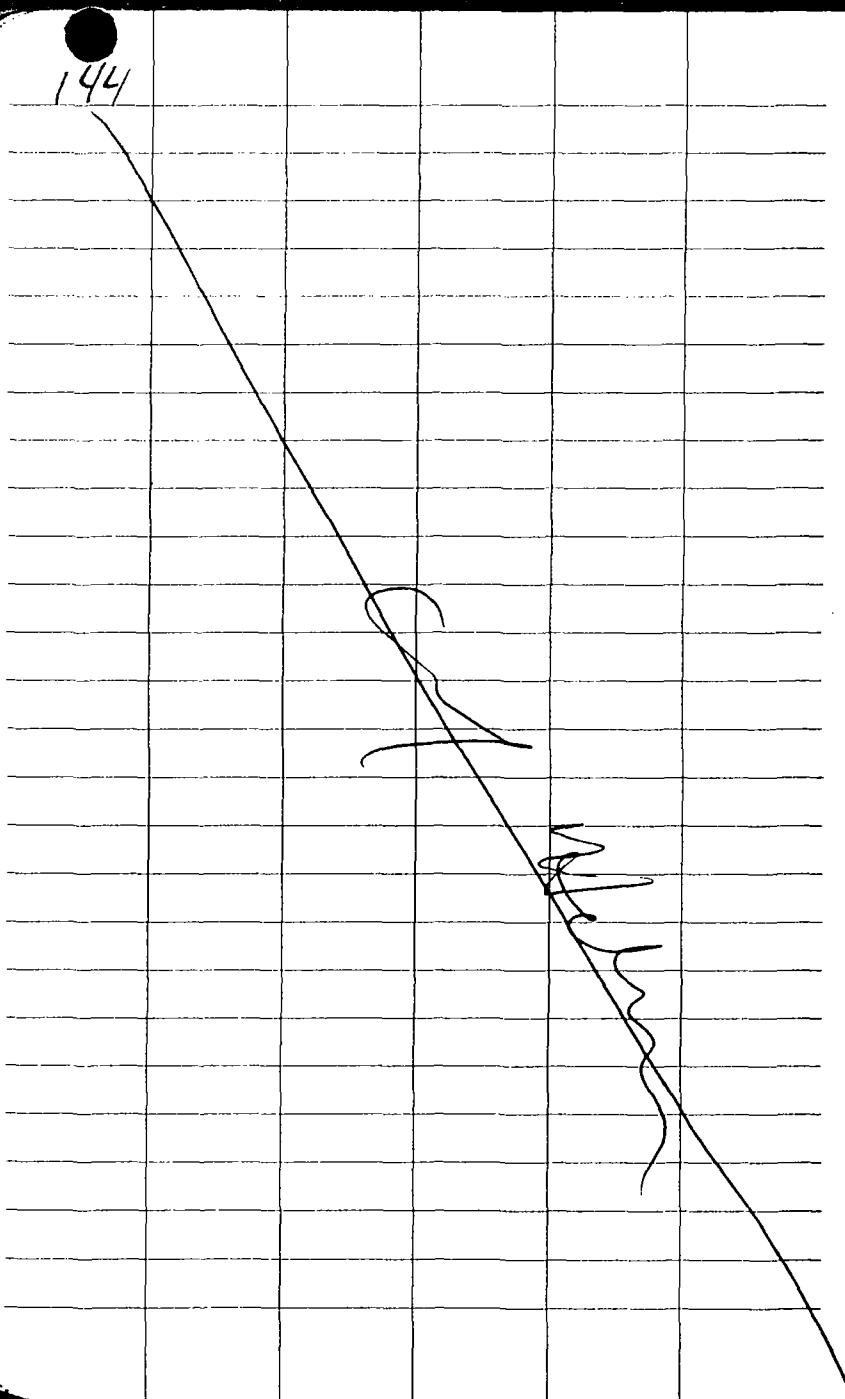
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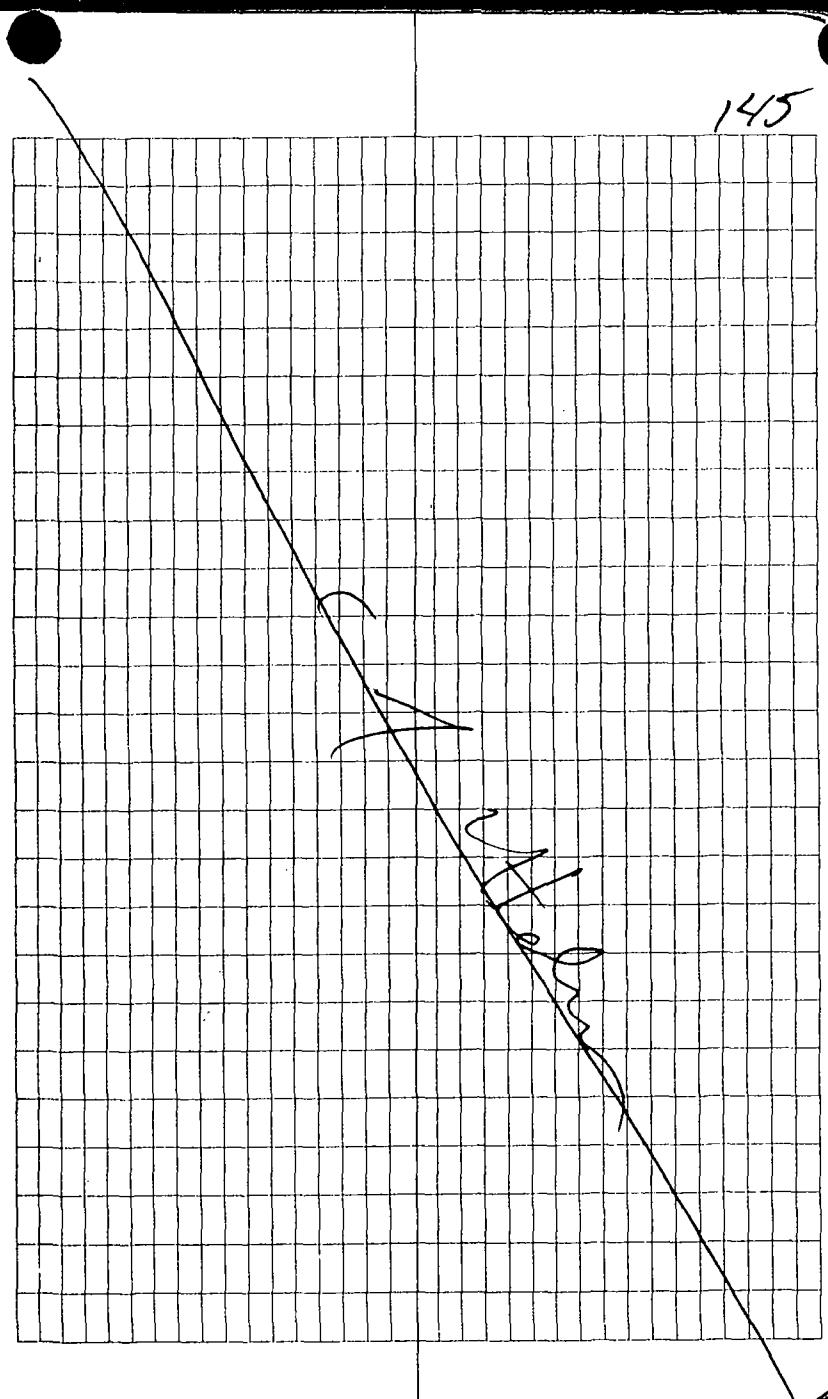
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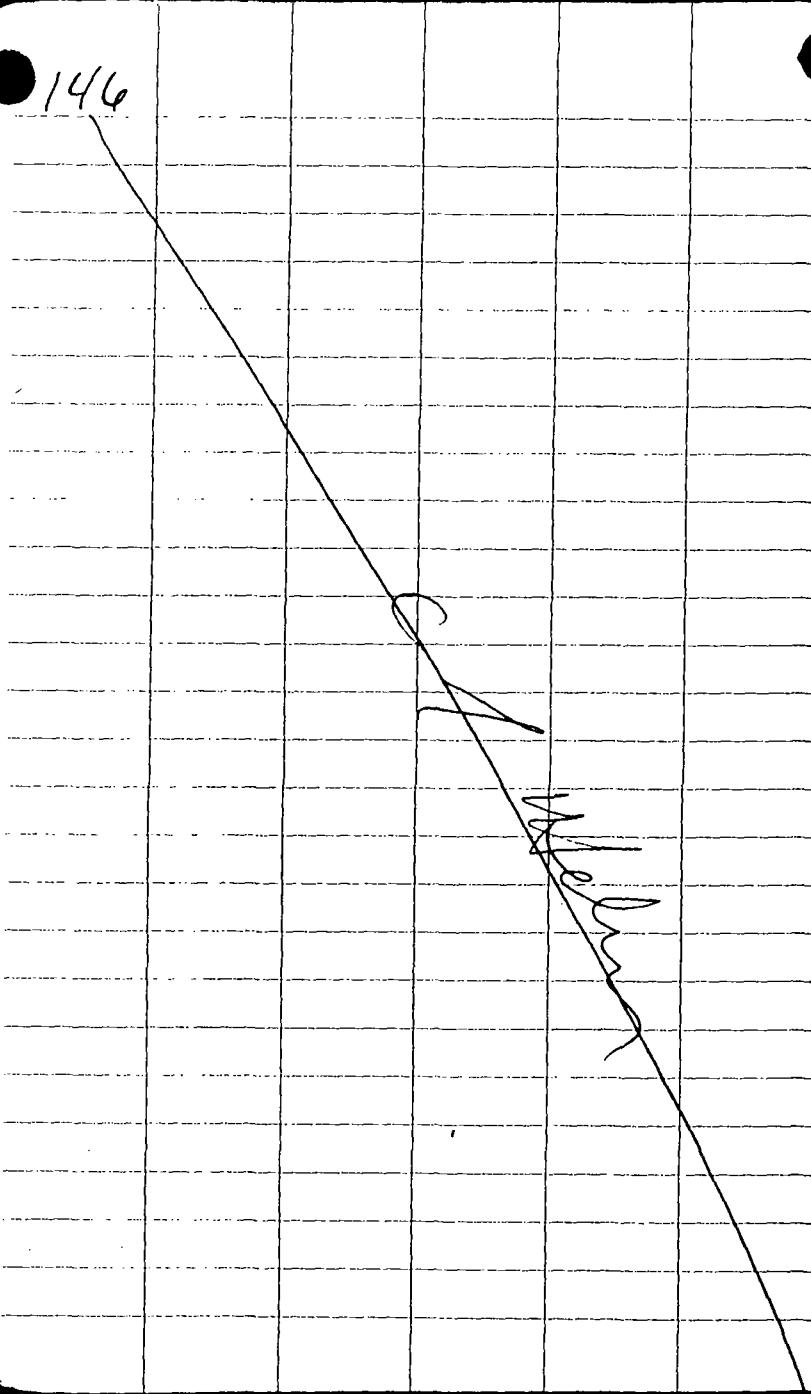
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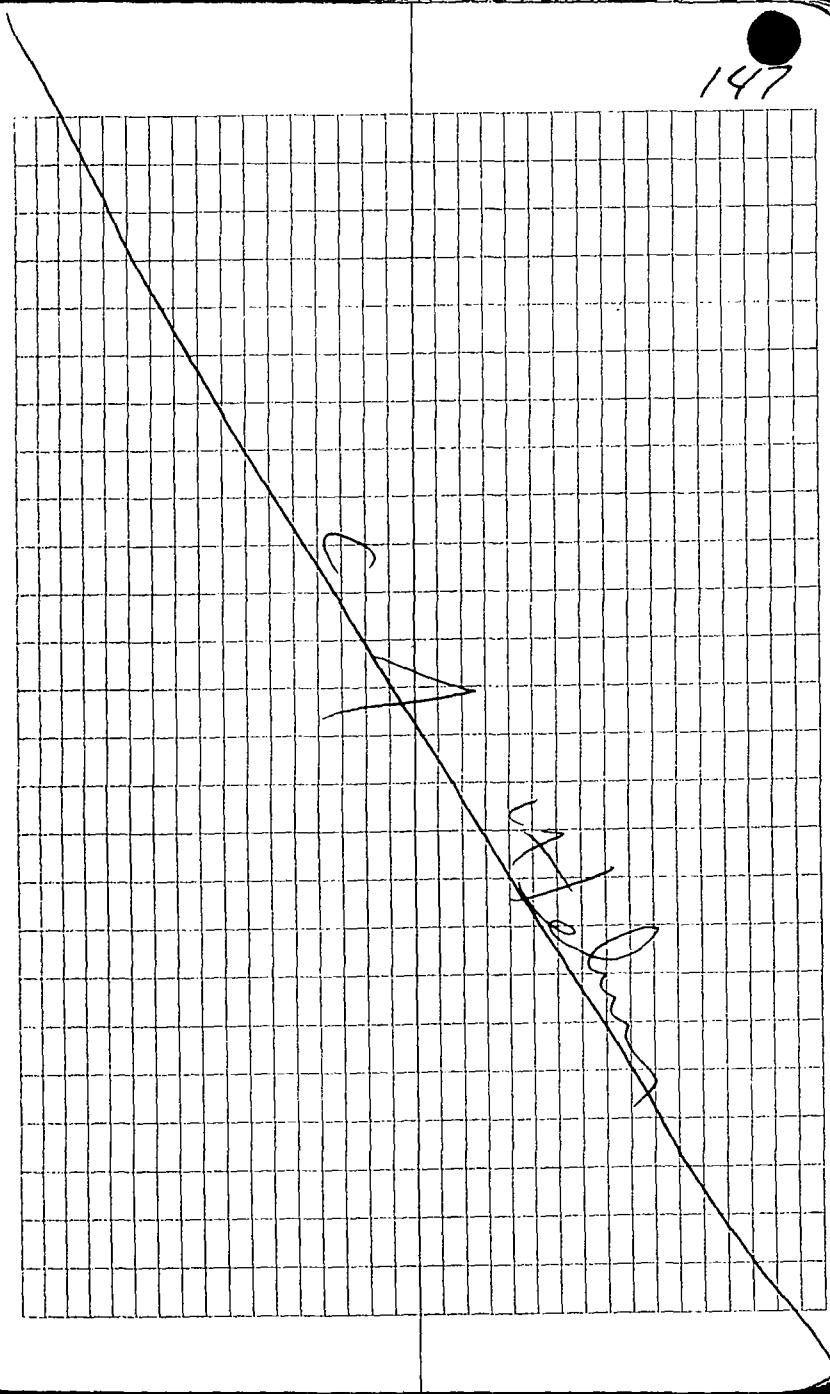
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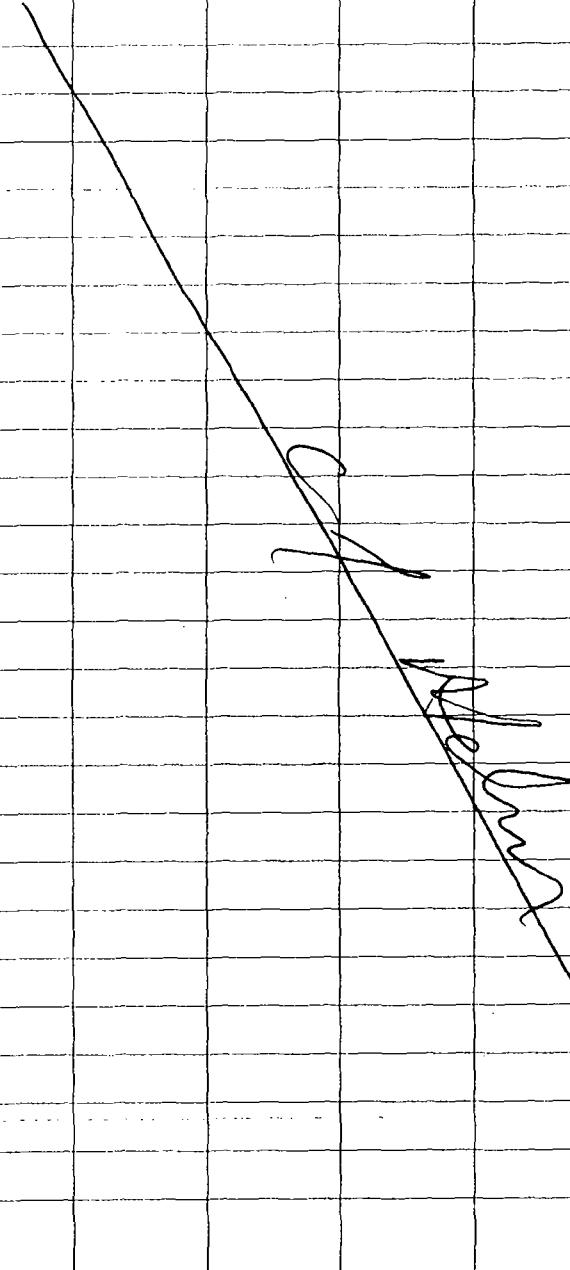
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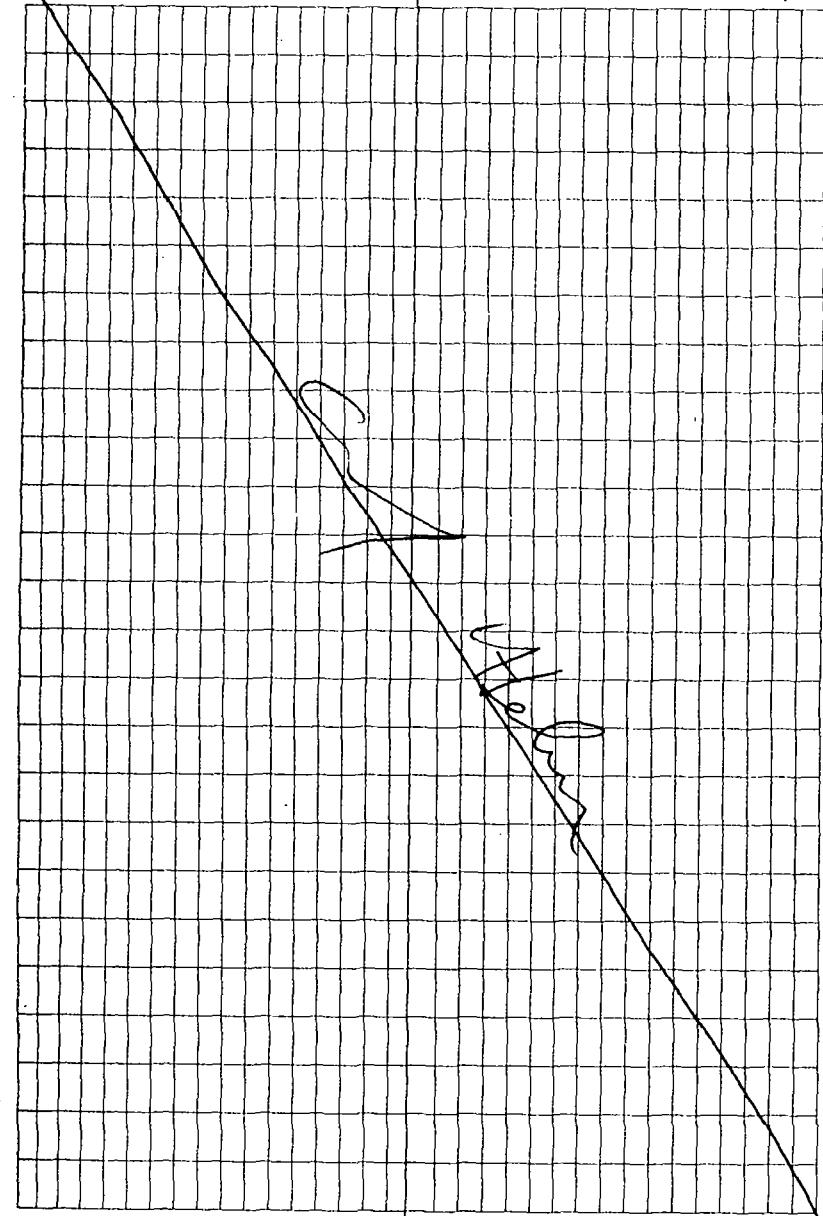
147



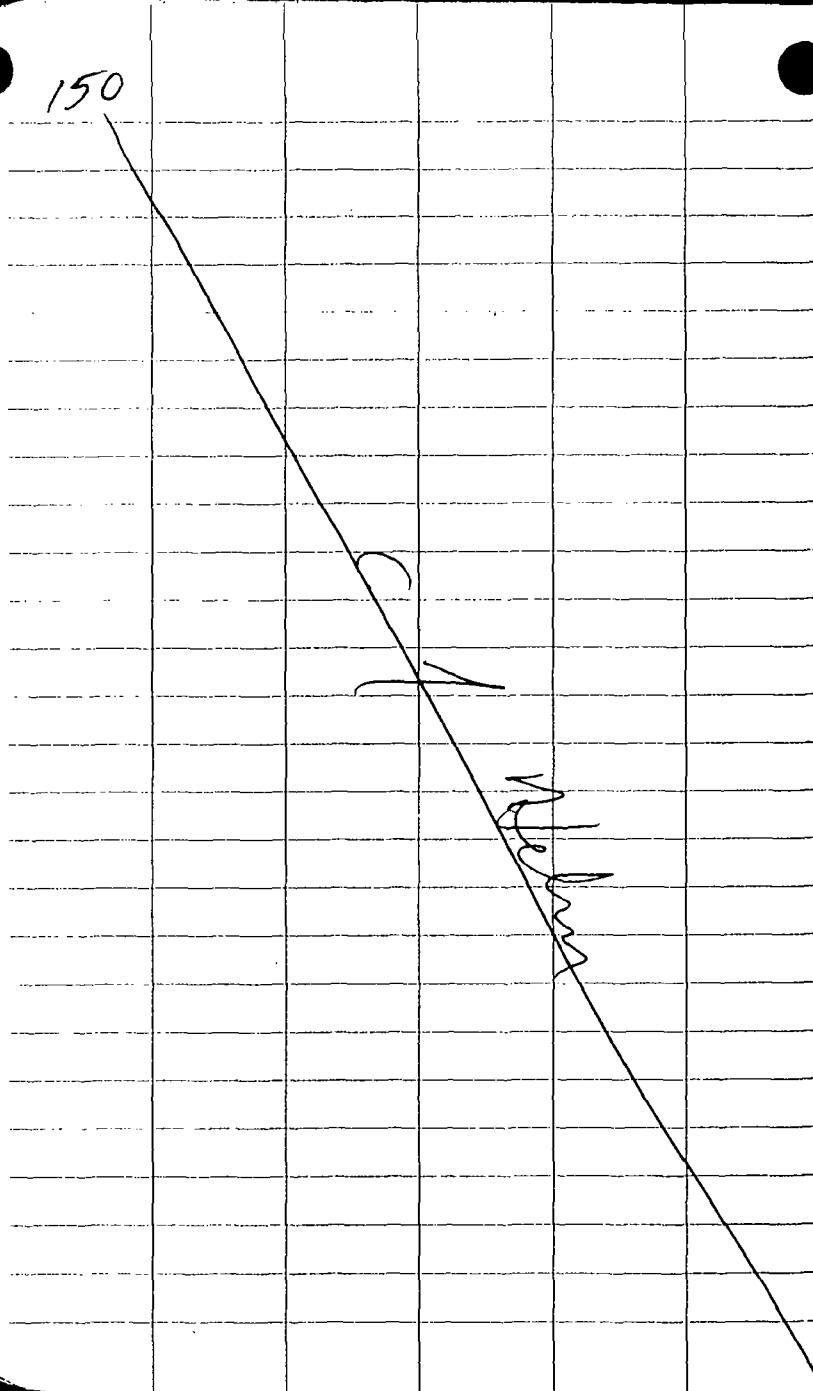
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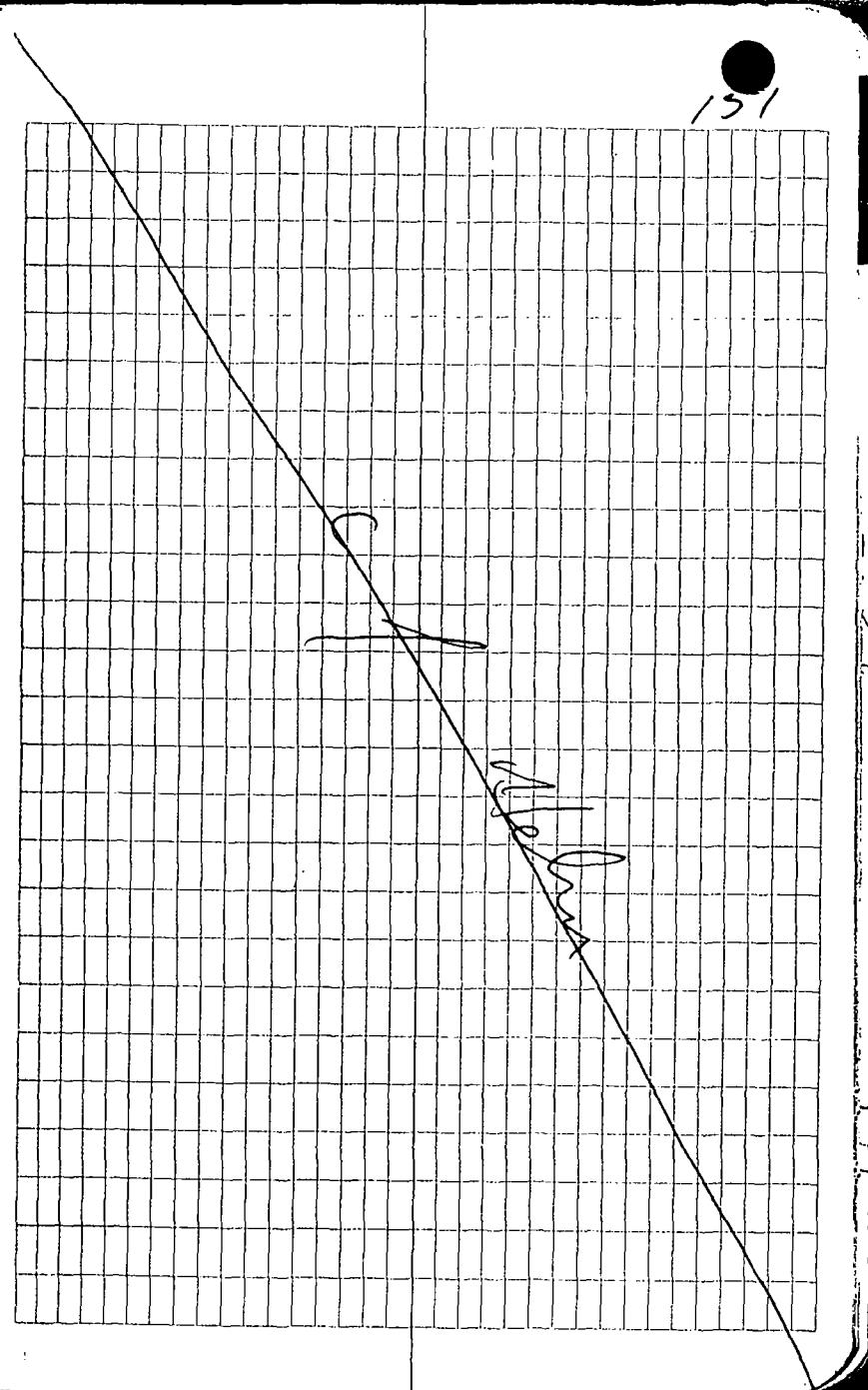
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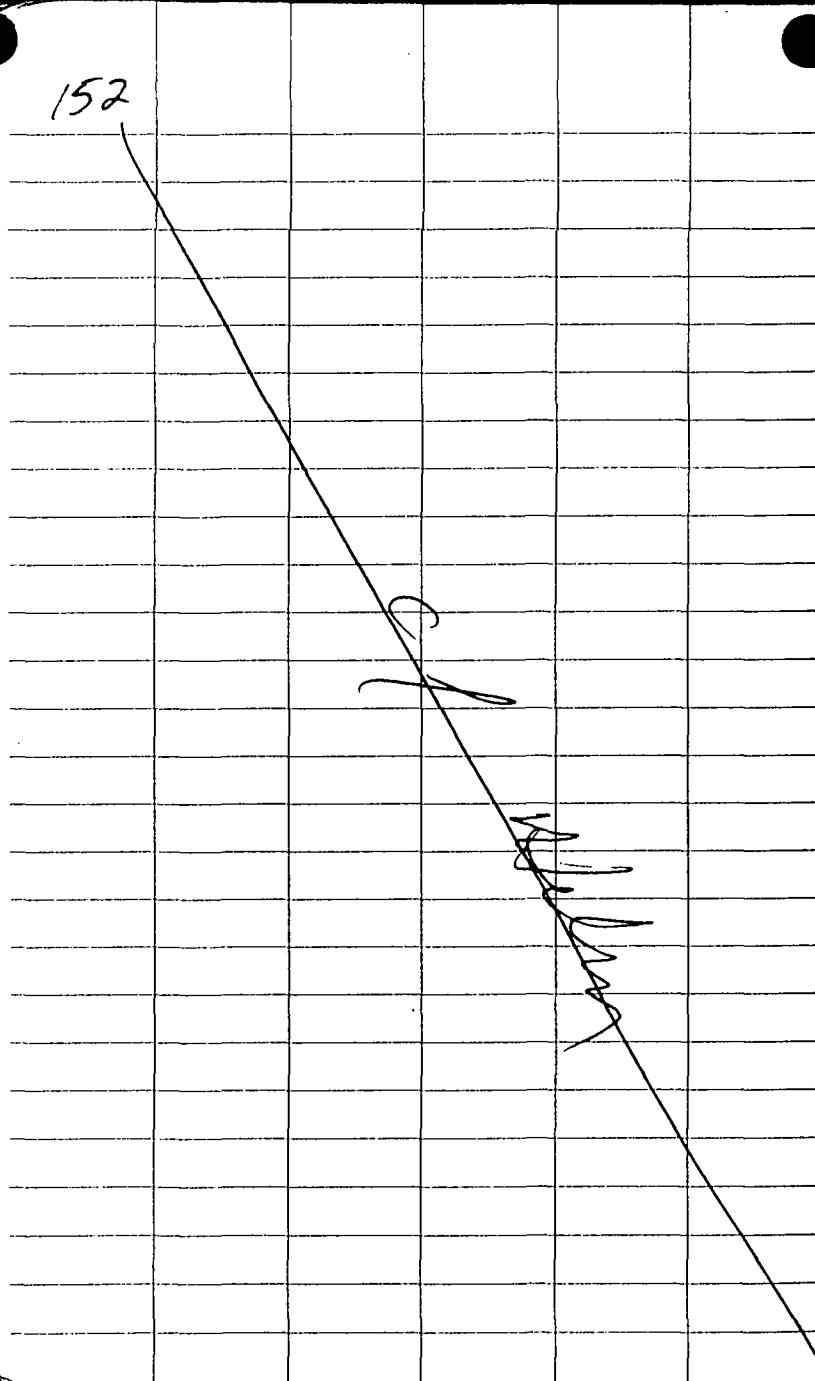
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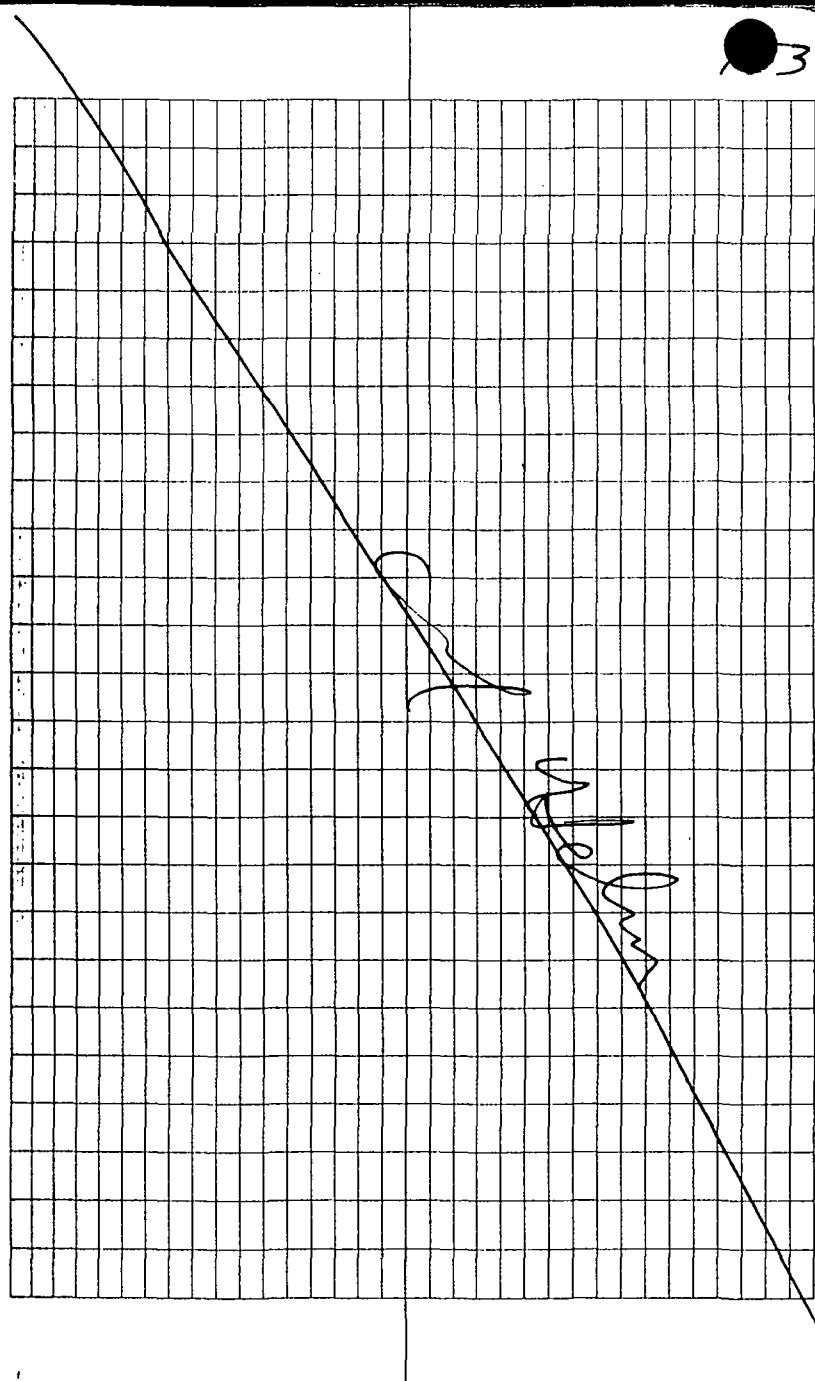
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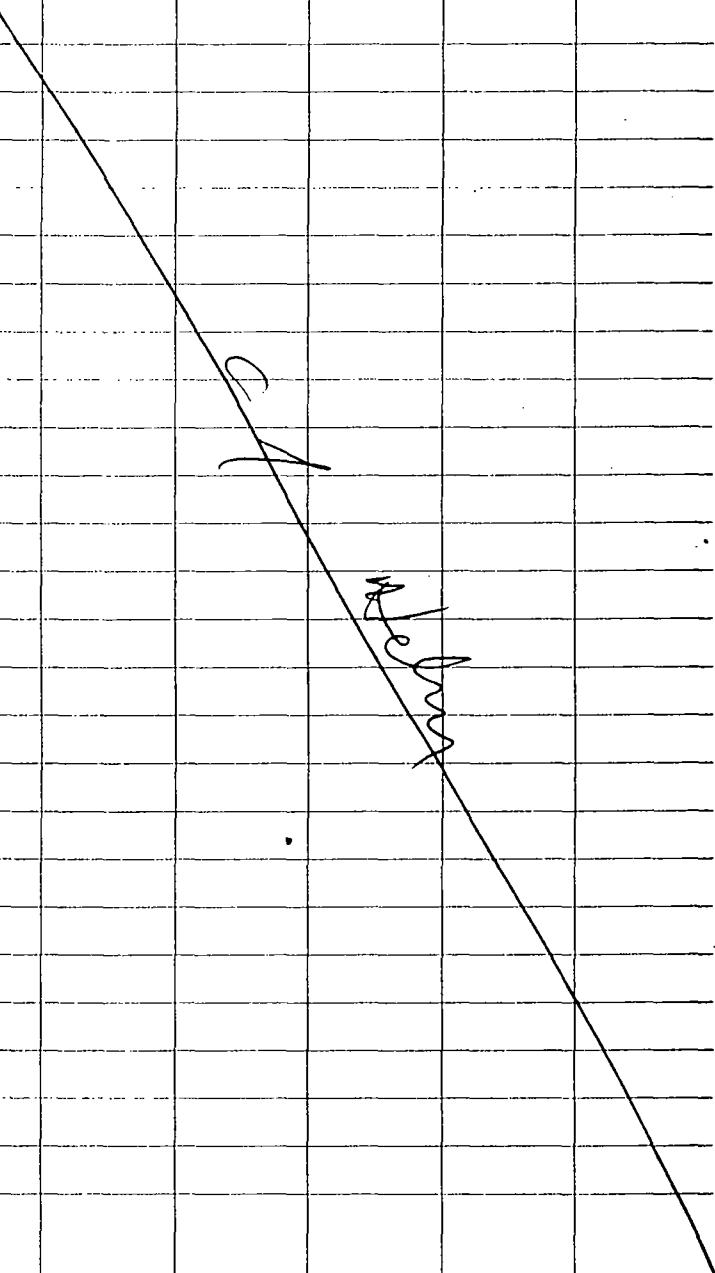
152



153



1/1



## Photographic Log

155

Roll # (① = frame #) (#1 = Picture #)

# 1 (1) ASA at MW 28 to  
(N) Set 8' casing 1/30/96 10:05

# 2 2" split spoon (27.5'-29.5' b/s)

④ which indicate the gray clay layer  
and slough 1/30/96 13:20

# 3 Use of trash pipe to tramix

③ bent/com. string to start regulator  
(SE) space at mw-28 1/30/96 15:00

# 4 With Temp at -12°F, Drillers

④ try to keep holes from freezing  
using hand-held propane torch  
(E) at mw-28 1/31/96 0900

# 5 Core extraction into plastic

④ secure ④

# 6 ⑨ Placement into core box 2/1/96  
11:00

# 7 ⑩ Sampling of core by Jeff

# 8 - # 11 Rotasonic Drilling, Set-up & technique

⑤ Note: grouted casing in foreground  
2/1/96 14:00 +

154

SPK

Roll #1 cont.

- #12 Shale pieces of layer  
 (14) encountered at 108' bsls  
 at 1st borehole at mw-28 locale  
 2/1/96 1530
- #13 2" PVC, 5' screen placed, constructed  
 (12) in 1st borehole at mw-28.  
 2/2/96 10:15
- #14 The set-up of mw-28, PZ 44,  
 (11) and PZ-48. Not running 2/6/96, 1150
- #15 (10) Sampling point used for  
 vertical profiling 2/7/96 1245
- #16-27 Drill Rig set-up at mw-8  
 (00-9) 2/7/96 1400+

Roll #2

- (25) (24) #1, #2 slot size 6 screen, the  
 fine sands clogging it, 1025
- (23) (22) down procedures to clear 1040
- (21) slots 2/8/96
- 6-7 6w collection 8 ft 9-inutes 1305
- (19) (18) set-up. 2/8/96
- 18 Filling up screen with  
 (17) sand prior to lowering it down hole  
 per Stan Mangion's direction to 500'  
 2/9/96 910

SPK  
Roll 2 cont.

SPK  
 157

- #9 (16) 1" PVC PZ-44 being installed  
 2/13/96 8:28
- #10 (15) Grout mixer used by driller  
 2/13/96 9:10
- #11 (13) Weighing the grout at mw-31  
 2/14/96 15:40
- #12-14 (12) Installing float mounts  
 at mw-28 Locale 10:15
- (11) Notice: Leaked PVC riser  
 2/16/96 10:25
- #15 (9) Rig set-up at mw-10 Locale  
 2/20/96 0830
- #16 (8) Drillers placing sand pack in  
 (7) mw-30 at mw-10 locale  
 2/22/96 0850
- #17 (7) Drillers placing bentonite chips (1/8")  
 9m mw-30 (slowly dropping)  
 2/22/96 0940
- #18 (6) Using tape measure in mw-30 to  
 measure elevation of well materials 2/22 9:45
- #19 (5) Former PZ-44 - 111' end of well 1120 mw-9 (4)  
 2/23/96 10:15
- #20 (3) EDEM videotape recording 2/23/96 10:15 2/23 12:00
- #22 (2) mw-30 & mw-33 completed #23, 24 Sheen near P-63
- #25 Core from mw-9, 85-95' bsls core  
 (00) 2/23/96 see clay at 92.5' bsls

158) Roll # 3

- #1 (25) Drilling MW-29 at MW-9 location 2/24 9:15
- #2 (24) Drilling MW-35 at MW-4 location in Landfill 2/24 10:45
- #3 BV's, Mona Points videotaping vertical profiling techniques at MW-35 (MW-4 locale) 2/24 11:25
- #4 (22) Recovery procedures used by #5 (21) drillers at decom pit prior to MW-7 drilling 2/24 11:45
- #6 (20) Inside site trailer, photos
- #7 (19) of Field GC unit & PC 2/24 12:30
- #8 Jeff photographing all cores (18) calculated per Soil 2/24 12:05
- #9 Collecting soil size (grain size) (17) analysis samples from cores at the screen interval. 2/24 12:15
- #10 General site photo of the (16) active ACS site's front gate. 2/25 8:15
- #11 Set-up at MW-36, MW-7 locale (15) 2/25 8:20
- #12 - #14 Photos of the tool called: (14) (13) (12)

Roll #3 cont.

9/10  
159

"Tapered Tap" device  
drillers used to recover  
broken S "casing down hole"  
2/25/96 11:10

#15 Success using "Taper Tap"

- (11) casing seen being pulled out of bore hole  
2/25/96 11:55

#16 At Landfill, existing  
(10) MW monitoring well

12:00 2/25/96

- #17 Completed protective cap  
(9) for MW-35 at Landfill  
Note: the unused permanent  
casing between pro-tap & drum  
12:03 2/25/96

- #18 Completed pro-taps at the  
(8) MW-9 locale for MW-29  
and MW-34, Note transducer  
cord at MW-9 12:10 2/25/96

- #19 Montgomery Watson's Jeff Ramsey  
(7) measures PZ-44 (PVC) dimensions  
13:50 2/25/96



Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 3 Photo #: 1

Date: 1-30-96 Time: 1005

Photographer: Carter J. Helm

Description: North view of hollow stem augering into the upper clay unit at MW-28 location.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 3 Photo #: 2

Date: 1-30-96 Time: 1320

Photographer: Carter J. Helm

Description: Part of the upper clay layer at MW-28.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 3  
Date: 1-30-96 Time: 1500  
Photographer: Carter J. Helm  
Description: Southeast view, using a tremie pipe to grout the borehole.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 4  
Date: 1-31-96 Time: 0900  
Photographer: Carter J. Helm  
Description: Boart Longyear uses propane torches on the mud tub at MW-28 to keep hoses from freezing in sub zero temperatures during grout mixing.



Site: American Chemical Services, Inc.  
Proj. #: 71670

Roll: 3 Photo #: 5  
Date: 2-1-96 Time: 1058

Photographer: Carter J. Helm

Description: East view of a core sample being vibrated out of the core barrel and into a plastic sleeve at PZ-43.



Site: American Chemical Services, Inc.  
Proj. #: 71670

Roll: 3 Photo #: 6  
Date: 2-1-96 Time: 1100

Photographer: Carter J. Helm

Description: Southeast view of a 5 foot core sample, already in a plastic sleeve, to be placed in a core box.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 7  
Date: 2-1-96 Time: 1103  
Photographer: Carter J. Helm  
Description: A view inside the Montgomery Watson van where core samples are temporarily stored.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 8  
Date: 2-1-96 Time: 1105  
Photographer: Carter J. Helm  
Description: Montgomery Watson is collecting a soil sample for headspace analysis.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 3 Photo #: 9

Date: 2-1-96 Time: 1402

Photographer: Carter J. Helm

Description: A three inch diameter drill rod is added to the string already down the borehole.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 3 Photo #: 10

Date: 2-1-96 Time: 1405

Photographer: Carter J. Helm

Description: The drill rig's tilting head or tub which is used to vibrate casing or drill rods into the stratum below.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 11  
Date: 2-1-96 Time: 1410  
Photographer: Carter J. Helm  
Description: A north view of AW rod removal at PZ-43.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 12  
Date: 2-1-96 Time: 1530  
Photographer: Carter J. Helm  
Description: Shale at 108 feet bls in PZ-43. This shale is the transitional layer between the lower clay unit and bedrock.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 13  
Date: 2-2-96 Time: 1015  
Photographer: Carter J. Helm  
Description: East view of piezometer installation at PZ-43.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 14  
Date: 2-6-96 Time: 1150  
Photographer: Carter J. Helm  
Description: North view of the MW-17 area well cluster before construction is complete. MW-28 is in the foreground, PZ-42 is toward the center, and farthest away is PZ-43 with 2 feet of stick-up.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 15  
Date: 2-7-96 Time: 1245  
Photographer: Carter J. Helm  
Description: The 3 inch point and screen or power punch in the retracted position.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 16  
Date: 2-7-96 Time: 1400  
Photographer: Carter J. Helm  
Description: The Grundfos pump and water level used during sampling.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 3 Photo #: 17

Date: 2-7-96 Time: 1401

Photographer: Carter J. Helm

Description: The rotosonic drill rig's multi-positional head. Note the 2 sets of threads on the drill stem. The larger top threads are for 5 inch casing, the smaller threads are for 3 inch rods.

Site: American Chemical Services, Inc.

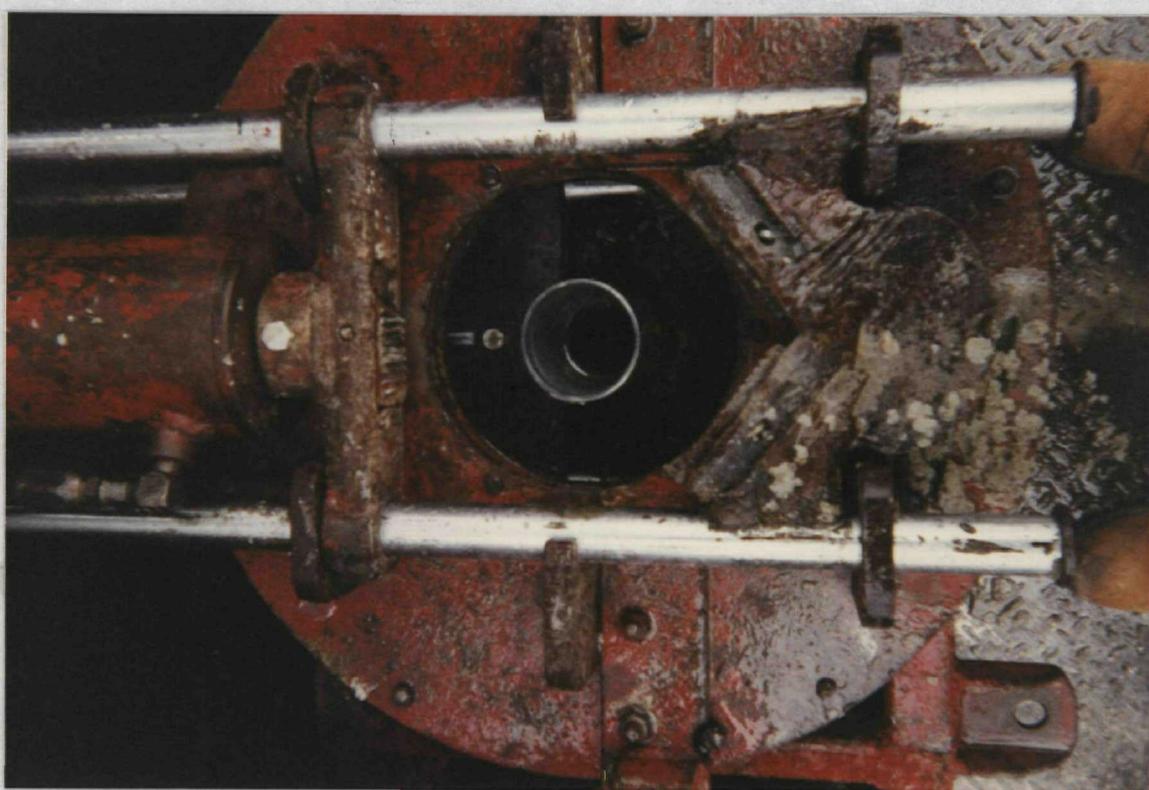
Proj. #: 71670

Roll: 3 Photo #: 18

Date: 2-7-96 Time: 1402

Photographer: Carter J. Helm

Description: A downward view from the drilling platform. Note the 5 inch temporary casing in the borehole.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 19  
Date: 2-7-96 Time: 1404  
Photographer: Carter J. Helm  
Description: South view of the MW-08 location.

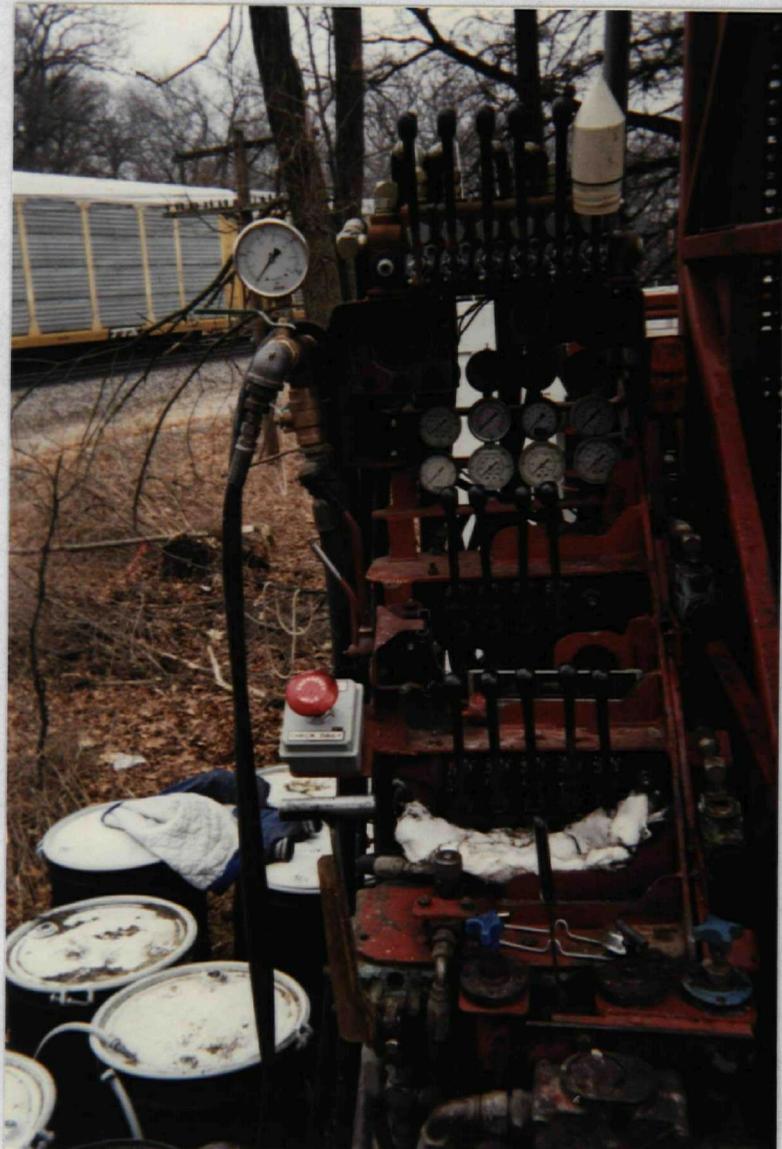
Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 20  
Date: 2-7-96 Time: 1405  
Photographer: Carter J. Helm  
Description: Northeast view of the MW-08 location.  
The Grundfos pump and hose are next  
to the borehole.





Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 21  
Date: 2-7-96 Time: 1407  
Photographer: Carter J. Helm  
Description: Close-up of the rotosonic coring drill bit.

Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 22  
Date: 2-7-96 Time: 1408  
Photographer: Carter J. Helm  
Description: View of the rotosonic drill rig controls.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 23  
Date: 2-7-96 Time: 1410  
Photographer: Carter J. Helm  
Description: View of the rotosonic drill rig head.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 3 Photo #: 24  
Date: 2-7-96 Time: 1412  
Photographer: Carter J. Helm  
Description: East view of the rotosonic drill rig at MW-08.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 3 Photo #: 25

Date: 2-7-96 Time: 1413

Photographer: Carter J. Helm

Description: North view of the MW-08 location. Note the proximity of this location to the railroad tracks.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 1

Date: 2-8-96 Time: 1040

Photographer: Carter J. Helm

Description: Boart Longyear decontaminates the power punch screen. In this photograph, silt and fine sand clogging the screen is blown out using high pressure water.

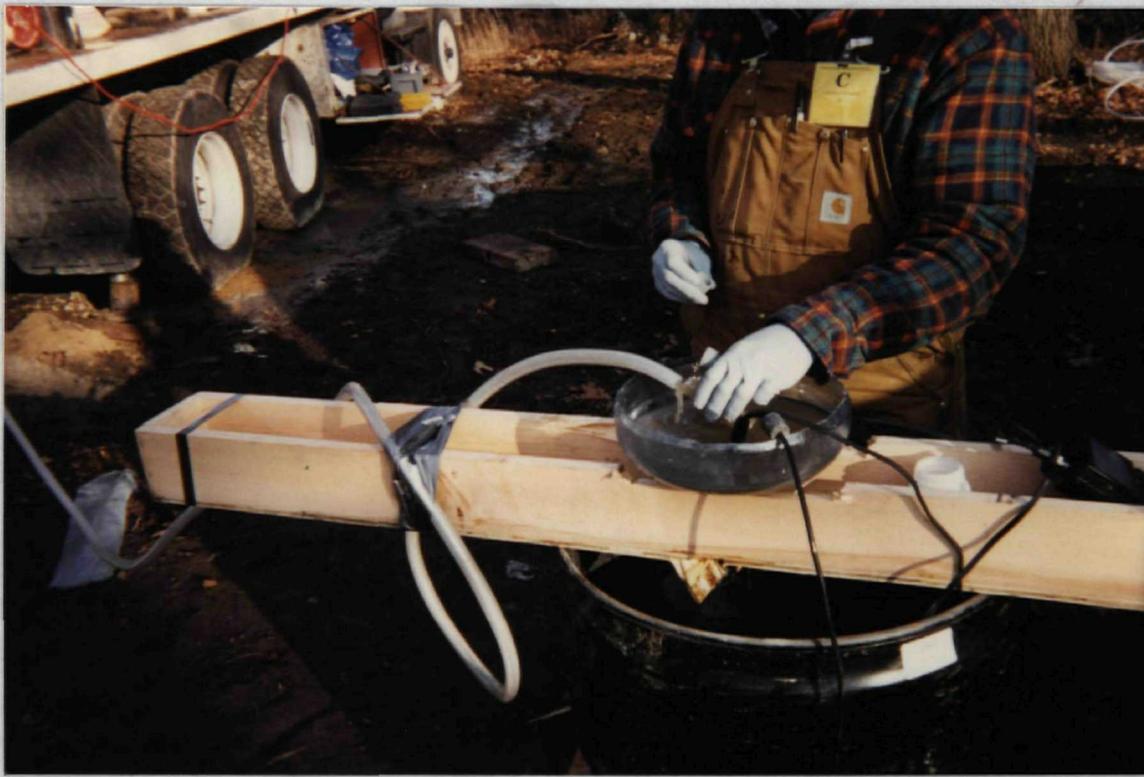


Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 2  
Date: 2-8-96 Time: 1045  
Photographer: Carter J. Helm  
Description: Boat Longyear inspects material removed from the screen after decontamination.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 3  
Date: 2-8-96 Time: 1303  
Photographer: Carter J. Helm  
Description: Purging a borehole at MW-08. Note instruments are placed so that in-line field parameters can be read.





Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 4  
Date: 2-8-96 Time: 1306  
Photographer: Carter J. Helm  
Description: Montgomery Watson collects a ground-water sample at MW-08.

Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 5  
Date: 2-9-96 Time: 0910  
Photographer: Carter J. Helm  
Description: Northwest view of clean filter sand being placed inside the power punch screen.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 6  
Date: 2-13-96 Time: 0828  
Photographer: Carter J. Helm  
Description: Northwest view PZ-44. Note: MW-32 replaced PZ-44 after volatiles were found at the base of the lower aquifer.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 7  
Date: 2-13-96 Time: 0910  
Photographer: Carter J. Helm  
Description: North view of the grout mixing equipment.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 8  
Date: 2-13-96 Time: 1335  
Photographer: Carter J. Helm  
Description: Paper towels and rags are used to absorb leaking hydraulic oil.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 9  
Date: 2-14-96 Time: 1540  
Photographer: Carter J. Helm  
Description: After mixing the grout at MW-31, the grout weighs in at 10.2 lbs/gal.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 10

Date: 2-16-96 Time: 1015

Photographer: Carter J. Helm

Description: Protective flush mounts at the MW-17 location are installed.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 11

Date: 2-16-96 Time: 1025

Photographer: Carter J. Helm

Description: While cutting the permanent casing with a torch, the PZ-42 casing was burned. The casing was cut below the burn mark to install the flush mounted protective top.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 12

Date: 2-20-96 Time: 0830

Photographer: Carter J. Helm

Description: North view of the rotosonic drill rig set-up at the MW-10 location. Notice the gravel installed over the fabric in the wetland area

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 13

Date: 2-22-96 Time: 0850

Photographer: Carter J. Helm

Description: North view of sand pack placement around the MW-30 screen. The sand was slowly poured around the well casing to avoid bridging within the annular space.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 14

Date: 2-22-96 Time: 0940

Photographer: Carter J. Helm

Description: North view of seal placement at MW-30. Pure 3/8 inch bentonite chips are being slowly poured down the well.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 15

Date: 2-22-96 Time: 0945

Photographer: Carter J. Helm

Description: Northeast view of Boart Longyear measuring depth to the top of the bentonite seal.





Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 16  
Date: 2-22-96 Time: 1650  
Photographer: Carter J. Helm  
Description: Southwest view of drillers setting 5 inch temporary casing at MW-09.

Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 17  
Date: 2-23-96 Time: 1015  
Photographer: Carter J. Helm  
Description: South view of IDEM videotaping rotosonic and vertical profiling techniques at MW-09.





Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 18  
Date: 2-23-96 Time: 1145  
Photographer: Carter J. Helm  
Description: Northwest view of MW-33 and MW-30.

Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 4 Photo #: 19  
Date: 2-23-96 Time: 1205  
Photographer: Carter J. Helm  
Description: West view of standing water 18 feet west  
of P-63. A sheen was observed on the  
water body. A standing water level gauge  
is in the center of the standing water.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 20

Date: 2-23-96 Time: 1211

Photographer: Carter J. Helm

Description: South view of the standing water located just west of P-63.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 4 Photo #: 21

Date: 2-23-96 Time: 1412

Photographer: Carter J. Helm

Description: The lower clay unit encountered at 92.5 feet bls in MW-34.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 5 Photo #: 1

Date: 2-24-96 Time: 0915

Photographer: Carter J. Helm

Description: Northwest view of rotosonic drilling at MW-29. Note the transducer wire (yellow) inside of MW-09.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 5 Photo #: 2

Date: 2-24-96 Time: 1045

Photographer: Carter J. Helm

Description: North view of drilling at MW-35.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 5 Photo #: 3

Date: 2-24-96 Time: 1125

Photographer: Carter J. Helm

Description: West view of the vertical profiling station set up at the M4 location. Black and Veatch videotapes rotosonic and vertical profiling techniques.

Site: American Chemical Services, Inc.

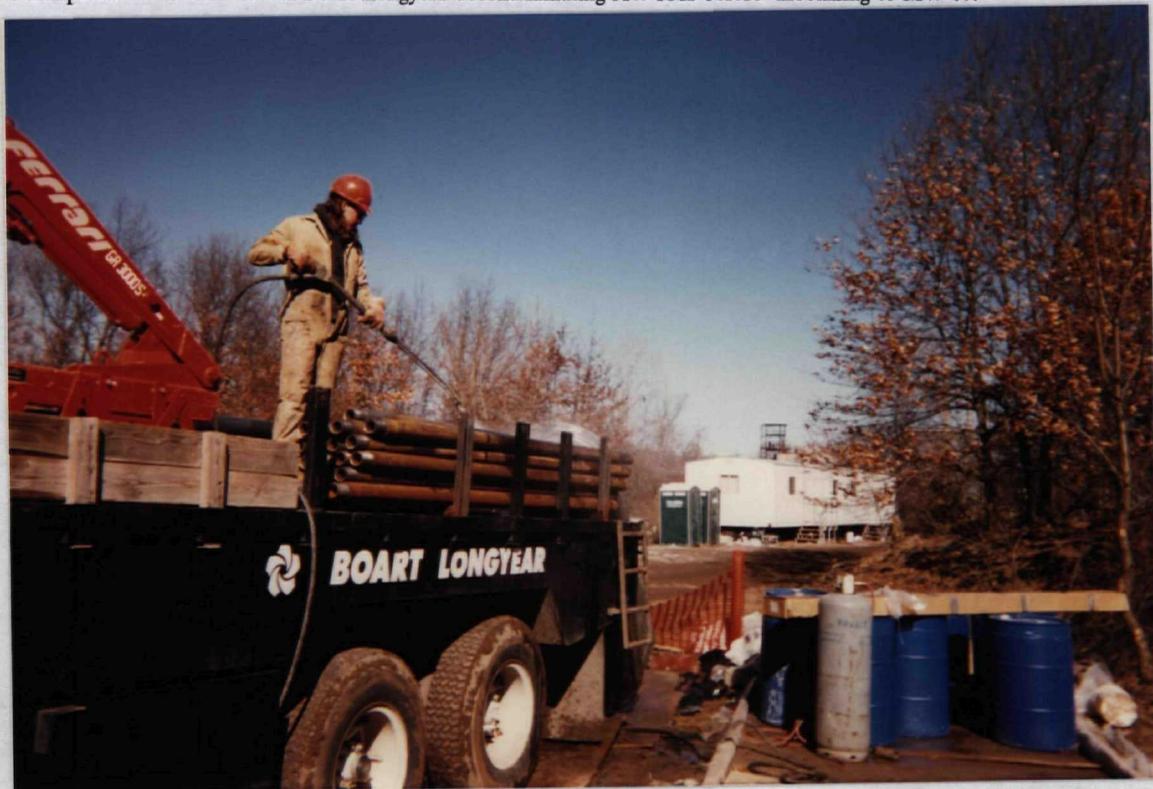
Proj. #: 71670

Roll: 5 Photo #: 4

Date: 2-24-96 Time: 1143

Photographer: Carter J. Helm

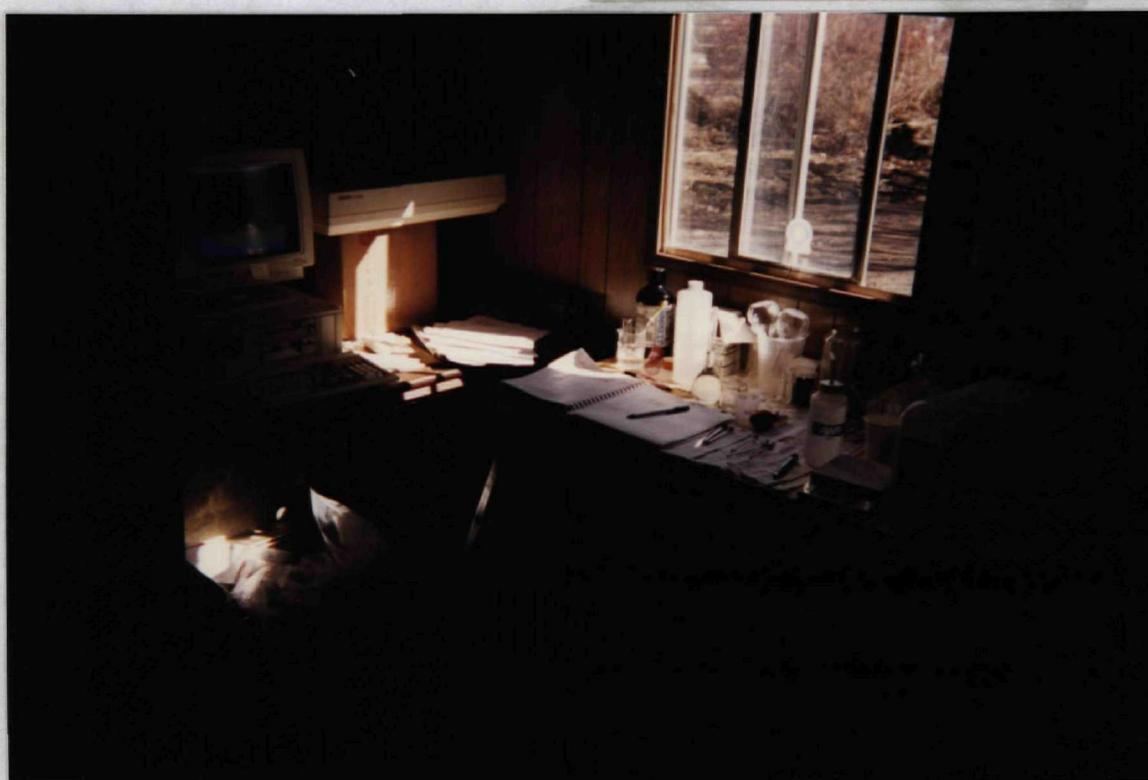
Description: North view of Boart Longyear decontaminating AW rods before mobilizing to MW-07.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 5 Photo #: 5  
Date: 2-24-96 Time: 1155  
Photographer: Carter J. Helm  
Description: West view of Boart Longyear decontaminating a mud tub.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 5 Photo #: 6  
Date: 2-24-96 Time: 1230  
Photographer: Carter J. Helm  
Description: A partial view of the mobile laboratory.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 5 Photo #: 7

Date: 2-24-96 Time: 1705

Photographer: Carter J. Helm

Description: Montgomery Watson photographs all core samples collected during this investigation.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 5 Photo #: 8

Date: 2-24-96 Time: 1715

Photographer: Carter J. Helm

Description: Montgomery Watson collects soil samples from the intervals where wells were screened . These samples were shipped to a geotechnical laboratory for grain size analyses.





Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 5 Photo #: 9  
Date: 2-25-96 Time: 0815  
Photographer: Carter J. Helm  
Description: Southwest view of the ACS front gate.

Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 5 Photo #: 10  
Date: 2-25-96 Time: 0820  
Photographer: Carter J. Helm  
Description: Boart Longyear works at MW-36.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 5 Photo #: 12  
Date: 2-25-96 Time: 1110  
Photographer: Carter J. Helm  
Description: North view of a taper tap used to retrieve the down-hole casing string.

Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 5 Photo #: 13  
Date: 2-25-96 Time: 1115  
Photographer: Carter J. Helm  
Description: North view of the taper tap.



Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 5 Photo #: 14  
Date: 2-25-96 Time: 1155  
Photographer: Carter J. Helm  
Description: Northeast view of the temporary outer casing being retrieved.

Site: American Chemical Services, Inc.  
Proj. #: 71670  
Roll: 5 Photo #: 15  
Date: 2-25-96 Time: 1200  
Photographer: Carter J. Helm  
Description: East view of M4.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 5 Photo #: 16

Date: 2-25-96 Time: 1203

Photographer: Carter J. Helm

Description: Northwest view of MW-35 located near the M4 location.

Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 5 Photo #: 17

Date: 2-25-96 Time: 1210

Photographer: Carter J. Helm

Description: Northwest view of the MW-09 well cluster. Note the transducer wires exiting MW-09. The other two wells pictured are MW-29 and MW-34.





Site: American Chemical Services, Inc.

Proj. #: 71670

Roll: 5 Photo #: 18

Date: 2-25-96 Time: 1350

Photographer: Carter J. Helm

Description: Montgomery Watson measures piezometer construction materials before installation.